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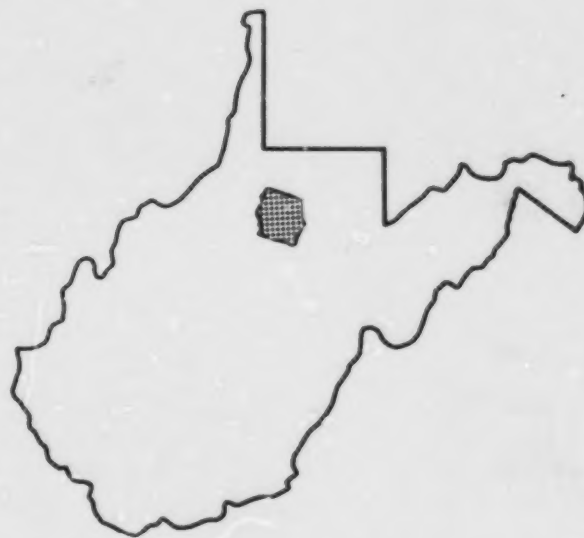
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FLOOD INSURANCE STUDY



**HARRISON COUNTY,
WEST VIRGINIA
UNINCORPORATED AREAS**



JULY 4, 1988



Federal Emergency Management Agency

COMMUNITY NUMBER - 540053

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**NOTICE TO
FLOOD INSURANCE STUDY USERS**

Communities participating in the National Flood Insurance Program (NFIP) have established repositories of flood hazard data for floodplain management and flood insurance study purposes. This Flood Insurance Study (FIS) may not contain all data available within the repository. It is advisable to contact the community repository for any additional data.

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FLOOD INSURANCE STUDY
UNINCORPORATED AREAS OF HARRISON COUNTY, WEST VIRGINIA

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study investigates the existence and severity of flood hazards in the unincorporated areas of Harrison County, West Virginia, and aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This study has developed flood risk data for various areas of the community that will be used to establish actuarial flood insurance rates and assist the community in its efforts to promote sound floodplain management. Minimum floodplain management requirements for participation in the National Flood Insurance Program (NFIP) are set forth in the Code of Federal Regulations at 44 CFR, 60.3.

In some states or communities, floodplain management criteria or regulations may exist that are more restrictive or comprehensive than the minimum Federal requirements. In such cases, the more restrictive criteria take precedence and the state (or other jurisdictional agency) will be able to explain them.

1.2 Authority and Acknowledgments

The sources of authority for this Flood Insurance Study are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

The hydrologic and hydraulic analyses for this study were prepared by the U. S. Army Corps of Engineers (COE), Pittsburgh District, for the Federal Emergency Management Agency (FEMA), under Inter-Agency Agreement No. EMW-E-1153, Project Order No. 1, Amendment No. 31. This work was completed in August 1986.

1.3 Coordination

On August 1, 1983, an initial Consultation and Coordination Officer's (CCO) meeting was held with representatives from FEMA, the county, and the COE (the study contractor) to determine the streams to be studied by detailed methods.

Coordination of this study involved Notice of Initiation letters, public meetings, and incidental meetings with county officials. Notice of Initiation of study letters dated December 1, 1983, announced the start of the study and were sent to all Federal, State, county, and local government agencies, and private firms that could make input to the study.

On August 20, 1987, a final CCO meeting was held with representatives from FEMA, the county, and the study contractor to review the results of the study.

2.0 AREA STUDIED

2.1 Scope of Study

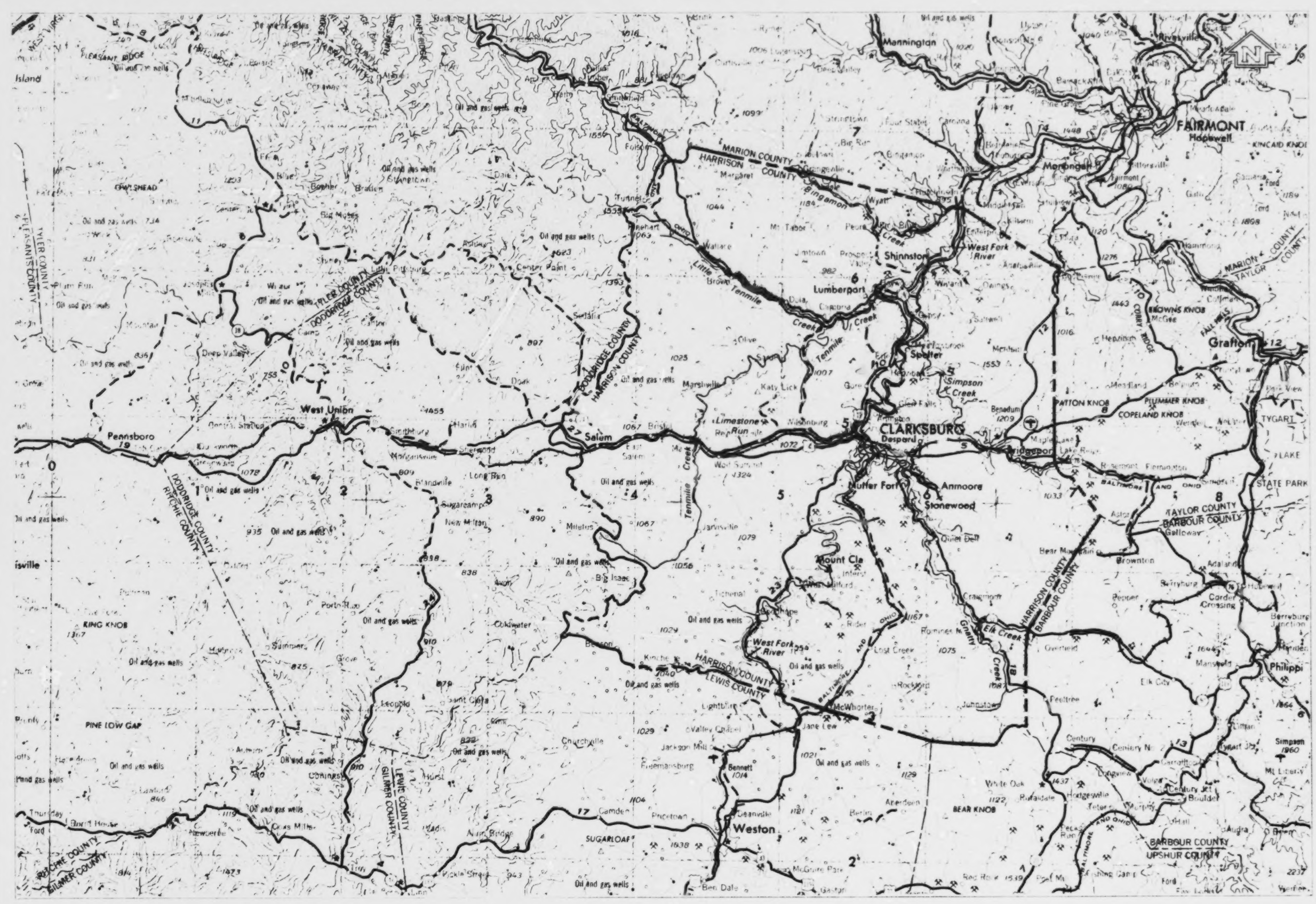
This Flood Insurance Study covers the unincorporated areas of Harrison County, West Virginia. The following communities are located within the county boundary but are not included in this study: the Towns of Anmoore, Lost Creek, Lumberport, Nutter Fort, Stonewood, and West Milford; and the Cities of Bridgeport, Clarksburg, Salem, and Shinnston. The area of study is shown on the Vicinity Map (Figure 1).

The following streams were studied by detailed methods:

<u>Stream</u>	<u>Limits of Detailed Study</u>
West Fork River	for its entire length within the county;
Bingamon Creek	from its confluence with the West Fork River to approximately 1,200 feet upstream of County Route 3-1;
Tenmile Creek	from its confluence with the West Fork River to approximately 125 feet downstream of State Route 50;
Little Tenmile Creek	from its confluence with Tenmile Creek to approximately 0.9 mile upstream of County Route 20-1;
Simpson Creek	from its confluence with the West Fork River to the county boundary;
Limestone Run	from the City of Clarksburg corporate limits to approximately 0.8 mile upstream of County Route 50-10;
Elk Creek	from the City of Clarksburg corporate limits to the upstream county boundary; and
Gnatty Creek	from its confluence with Elk Creek to the county boundary.

The areas studied by detailed methods were selected with priority given to all known flood hazard areas and areas of projected development and proposed construction through August 1991.

The following streams were studied by approximate methods: portions of Tenmile Creek, Limestone Run, Bingamon Creek, and Little Tenmile Creek; Arnold Run; Ann Moore Run; Ann Run; Big Elk Creek; Big Run; Booths Creek; Browns Creek; Brushy Fork; Coburn Fork; Coburns Creek;



FEDERAL EMERGENCY MANAGEMENT AGENCY

FIGURE 1

VICINITY MAP

**HARRISON COUNTY, WV
(UNINCORPORATED AREAS)**

Davissan Run; Duck Creek; Grass Run; Hackers Creek; Harris Fork; Horners Run; Indian Run; Isaacs Creek; Jones Run Creek; Kincheloe Creek; Left Fork Little Rockcamp Run; Little Run; Lost Creek; Middle Run; Peeltree Run; Right Fork; Rockcamp Run; Rooting Creek; Salem Fork; Shinns Run; Smithfield Run; Stone Coal Run; Thomas Fork; and Two Lick Creek. Approximate analyses were used to study those areas having a low development potential or minimal flood hazards. The scope and methods of study were proposed to, and agreed upon by, FEMA and Harrison County.

2.2 Community Description

Harrison County is located in north-central West Virginia. It is bordered by the unincorporated areas of Marion County to the north, the unincorporated areas of Taylor and Barbour Counties to the east, the unincorporated areas of Lewis and Upshur Counties to the south, and the unincorporated areas of Doddridge and Wetzel Counties to the west. The total land area contained within the unincorporated areas of the county is 418 square miles. In 1980, the population of Harrison County was 78,710, a 6.4 percent increase over the 1970 population of 73,028 (Reference 1).

The West Fork River has a drainage area of 881.4 square miles and joins the Tygart River at Fairmont to form the Monongahela River. The West Fork River basin is located in the unglaciated Allegheny Plateau in northern West Virginia. It is bordered on the east by the Tygart River basin, on the west by the Little Kanawha River, and on the south by the Kanawha River basin. The river flows in a northern direction through the county. The average slope along the West Fork River is approximately 2.3 feet per mile. The valley floor is approximately 0.1 mile wide. Local relief above the stream valley varies from a low of 880 feet to an average hilltop elevation of 1,400 feet. Bingamon Creek, Tenmile Creek, Simpson Creek, and Elk Creek are major tributaries that enter the West Fork River within Harrison County. Limestone Run, a minor tributary, also enters the West Fork River within Harrison County.

Bingamon Creek has a drainage area of approximately 46 square miles and joins the West Fork River at the Marion-Harrison county boundary. Bingamon Creek flows in a southeastern direction to Pine Bluff in Harrison County, it then flows in a northeastern direction where it enters the West Fork River. Bingamon Creek has a relatively narrow floodplain. The average slope through the county is approximately 9 feet per mile. Local relief above the stream valley varies from a low of 880 feet to an average hilltop elevation of 1,400 feet.

Tenmile Creek has a drainage area of 125.5 square miles and joins the West Fork River at Lumberport. Tenmile Creek flows in a northern direction through Union and Tenmile Districts, it then flows in a northeastern direction to where it enters the West Fork River. The average slope through the county is approximately 6 feet

per mile. Local relief above the stream valley varies from a low of 900 feet to an average hilltop elevation of 1,400 feet.

One major tributary entering Tenmile Creek within the county is Little Tenmile Creek. Little Tenmile Creek has a drainage area of 28.4 square miles and joins Tenmile Creek at Robey. Little Tenmile Creek flows in a southeastern direction to where it enters Tenmile Creek. The average slope through the county is approximately 10 feet per mile. Local relief above the stream valley varies from a low of 920 feet to an average hilltop elevation of 1,400 feet.

Simpson Creek has a drainage area of 74 square miles and joins the West Fork River at Spelter. Simpson Creek flows in a northern direction from its headwaters in Pleasant District up to the Town of Flemington. It then flows in a northwestern direction through the City of Bridgeport before it enters the West Fork River at Spelter. The average slope through the county is approximately 6 feet per mile. Local relief above the stream valley varies from a low of 900 feet to an average hilltop elevation of 1,300 feet.

Limestone Run has a drainage area of 10.3 square miles and joins the West Fork River at Clarksburg. Limestone Run flows in an eastern direction through the county. The average slope through the county is approximately 28 feet per mile. Local relief above the stream valley varies from a low of 900 feet to an average hilltop elevation of 1,400 feet.

Elk Creek has a drainage area of 121 square miles and joins the West Fork River at Clarksburg. Elk Creek flows in a northwestern direction through the county. The average slope through the county is approximately 6 feet per mile and the valley floor is approximately 0.2 mile wide. Local relief above the stream valley varies from a low of 920 feet to an average hilltop elevation of 1,400 feet.

One major tributary entering Elk Creek within the county is Gnatty Creek. Gnatty Creek has a drainage area of 34 square miles and joins Elk Creek at approximately 15 miles upstream of its confluence. Gnatty Creek flows in a northwestern direction through the county. The average slope through the county is approximately 5 feet per mile. Local relief above the stream valley varies from a low of 1,000 feet to an average hilltop elevation of 1,500 feet.

The climate in the county is temperate with an appreciable seasonal variation in temperature. The area is geographically located in a region of variable air mass activity subject to polar continental, tropical continental, and maritime air mass invasion. Weather changes are usually gradual but may have frequent and rapid changes resulting from air mass movements. Measurable precipitation occurs on approximately 110 days per year and amounts to an average of 45 inches. Temperatures range from an average of 34 degrees Fahrenheit (^oF) in January and February to an average of 74^oF in July.

2.3 Principal Flood Problems

Major floods have occurred on the streams studied by detailed methods at various times of the year. However, the main flood season is usually December through April. Most of the floods during this period are the result of heavy rain and snowmelt. It is possible for large floods with a duration of several days to occur at any time of the year. Although summer floods are not common on the West Fork River, the flood of July 1888 was the largest known flood. The highest known flood of record occurred on November 5, 1985, which reached a peak gage height of 30.50 feet at Enterprise. The following tabulation presents major floods on the West Fork River as measured on the U. S. Geological Survey (USGS) gaging station (No. 0361000) at Enterprise:

<u>Date of Crest</u>	<u>Actual Stage (feet)</u>	<u>Elevation (feet)</u>	<u>Discharge (cfs)</u>
November 5, 1985	30.50*	899.95	40,500
March 7, 1967	28.05	897.50	36,500
March 5, 1963	27.84	897.29	36,000
February 14, 1948	25.56	895.01	31,400
May 24, 1968	25.20	894.65	31,000
December 14, 1956	24.45	893.90	30,000
August 6, 1956	24.43	893.88	30,000
March 20, 1963	24.10	893.55	29,100
February 1, 1951	23.22	892.67	27,700

Note: Zero Elevation = 869.45 feet

The actual gage height of 30.50 feet and elevation 899.95 feet includes partial reduction of 1.3 feet by Stonewall Jackson Dam under construction at the time of the flood. A stage of 31.8 feet is the natural stage, or the stage that would have occurred if Stonewall Jackson Dam was not built.

The following tabulation presents major floods on the West Fork River as measured on the USGS gaging station (No. 03059000) at Clarksburg:

On Bingamon and Simpson Creek, high floods have occurred in June 1981 and September 1971, respectively. On Tenmile and Little Tenmile Creeks, the March 1963 and November 1985 floods are the floods of record. For Limestone Run, Elk Creek, and Gnatty Creek, the highest known flood occurred in February 1957. Other high floods occurred in March 1963, August 1980, and November 1985.

<u>Date of Crest</u>	<u>Actual Stage (feet)</u>	<u>Elevation (feet)</u>	<u>Discharge (cfs)</u>
November 5, 1985	18.76 [*]	950.58	30,000
March 7, 1967	14.40	946.22	17,800
June 25, 1950	11.15	942.97	16,900
December 9, 1972	11.15	942.97	14,400
March 20, 1963	10.16	941.98	16,000
February 14, 1948	10.13	941.95	15,980
March 5, 1963	10.00 ^{**}	941.82	15,800
February 10, 1957	11.27	943.09	15,100
May 24, 1968	9.98	941.80	13,690
February 1, 1951	8.78	940.60	13,360

Note: Zero Elevation = 931.82 feet

The actual gage height of 18.76 feet and elevation 950.6 feet includes partial reduction of 3.1 feet by Stonewall Jackson Dam under construction at the time of the flood. A stage of 21.86 feet is the natural stage, or the stage that would have occurred if Stonewall Jackson Dam was not built.

^{**} Gage height affected by debris on the dam.

2.4 Flood Protection Measures

Stonewall Jackson Dam is presently under construction on the West Fork River near Weston, approximately 17.5 miles upstream of the upstream county boundary of Harrison. Stonewall Jackson Lake, built and operated by the COE, will reduce the 100-year flood level at Harrison County by approximately 1 to 2 feet. The project will be in full operation in the fall of 1987 and will control approximately 12 percent of the total drainage area.

At the present time, there are no dams or local flood protection projects on Bingamon Creek, Tenmile Creek, Little Tenmile Creek, Simpson Creek, Limestone Run, Elk Creek, and Gnatty Creek, and no plans for such structures are in the foreseeable future.

3.0 ENGINEERING METHODS

For the flooding sources studied in detail in the county, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Flood events of a magnitude which are expected to be equaled or exceeded once on the average during any 10-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for floodplain management and for flood insurance rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10, 2, 1, and 0.2 percent chance, respectively, of being equaled or exceeded during any year. Although the recurrence interval represents the long term average period between floods of a specific magnitude, rare floods could occur at short

intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood which equals or exceeds the 100-year flood (1 percent chance of annual exceedence) in any 50-year period is approximately 40 percent (4 in 10), and, for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak discharge-frequency relationships for each flooding source studied in detail affecting the county.

Natural discharge-frequency curves on the West Fork River were developed following a standard log-Pearson Type III analysis as outlined in USGS Bulletin 17B (Reference 2). The stage discharge records used in the analysis of the West Fork River were obtained from the USGS gaging station No. 0361000 covering a 53-year period, and gaging station No. 03061000 at Clarksburg covering a 62 year period. The period includes water year 1985, which ends in September 1985 and does not include the major flood of November 5, 1985. Including the flood of November 5, 1985, would cause the flows shown in Table 1 to be somewhat higher. The present gaging station is operated jointly by the COE and the USGS. Flood flow frequencies developed at the gaging station were modified by means of an average reduction curve to reflect the reduction caused by the Stonewall Jackson Dam.

There are no gages or stream flow records available for Bingamon Creek, Tenmile Creek, Little Tenmile Creek, Simpson Creek, Limestone Run, Elk Creek, and Gnatty Creek. Flows for the 10-, 50-, 100-, and 500-year floods were developed by averaging flows computed from three different methods based on multiple regression formulae. The methods used were the COE "Untitled Regression Data," Federal Highway Administration Circular No. 17, and USGS West Virginia Department of Highways Research Project 16 (References 3, 4, and 5). The factors determining the flows were based on drainage area, stream length, stream slope, and basin shape.

A summary of the drainage area-peak discharge relationships for the streams studied by detailed methods is shown in Table 1, "Summary of Discharges."

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the sources studied were carried out to provide estimates of the elevations of floods of the selected recurrence intervals.

TABLE 1 - SUMMARY OF DISCHARGES

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs)			
		10-YEAR	50-YEAR	100-YEAR	500-YEAR
WEST FORK RIVER					
At downstream county boundary	305.0	31,000	43,100	48,000	62,000
Upstream of confluence of Tenmile Creek	610.5	27,300	33,950	35,750	43,500
Upstream of confluence of Simpson Creek	533.0	22,100	26,850	28,550	33,350
Upstream of confluence of Elk Creek	381.3	12,500	16,500	18,000	22,000
Upstream of confluence of Hackers Creek	307.7	8,000	10,200	11,200	13,100
BINGAMON CREEK					
At confluence with West Fork River	46.0	3,300	5,040	6,050	9,160
Upstream of confluence of Little Binghamon Creek	36.3	2,830	4,360	5,230	7,990
At upstream county boundary	26.5	2,280	3,550	4,290	6,490
TENMILE CREEK					
At confluence with West Fork River	125.5	10,500	13,000	14,000	17,000
Upstream of confluence of Jones Run Creek	112.6	9,600	11,870	12,790	15,520
Upstream of confluence of Little Tenmile Creek	83.7	7,700	9,520	10,260	12,450
Upstream of confluence of Rockcamp Run	66.1	6,720	8,330	8,970	10,890
Upstream of confluence of Grass Run	55.5	6,000	7,440	8,000	9,720
Upstream of confluence of Salem Fork	39.7	4,880	6,040	6,510	7,900
LITTLE TENMILE CREEK					
At confluence of Tenmile Creek	29.5	2,480	3,830	4,570	7,080
Upstream of confluence of Caldwell Run	24.0	2,160	3,310	4,030	6,110
Upstream of gage at Wallace	14.1	1,520	2,400	2,950	4,500

TABLE 1 - SUMMARY OF DISCHARGES - continued

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs)			
		10-YEAR	50-YEAR	100-YEAR	500-YEAR
SIMPSON CREEK					
At confluence with West Fork River	74.0	4,720	6,630	8,250	12,200
Upstream of confluence of Barnett Run	63.5	4,190	6,100	7,660	11,100
Upstream of confluence of Ann Run	45.4	3,270	4,990	5,990	9,080
Upstream of confluence of Beards Run	28.4	2,390	3,690	4,490	6,820
LIMESTONE RUN					
At confluence with West Fork River	10.3	1,250	2,030	2,460	3,720
Upstream of confluence of Simpson Fork	7.9	1,070	1,740	2,100	3,180
Upstream of confluence of Johnson Fork	5.8	870	1,440	1,740	2,670
ELK CREEK					
At confluence with West Fork River	121.0	8,000	14,000	16,800	22,000
At Plainwood Avenue	111.4	7,200	12,400	13,200	18,400
Upstream of confluence of Brushy Fork	84.7	5,800	9,100	10,900	15,900
Upstream of confluence of Gnatty Creek	36.5	3,020	4,730	5,670	8,360
GNATTY CREEK					
At confluence with Elk Creek	34.0	2,780	4,370	5,230	7,540
Upstream of confluence of Rooting Creek	21.3	2,200	3,450	4,130	5,960
Upstream of confluence of Peeltree Run	12.7	1,700	2,670	3,200	4,610

Cross-section data for the West Fork River were taken from COE field surveys conducted in December 1975 to January 1976. Field inspections were made to assure that the data obtained in previous years remains representative. Cross-section data for Binghamon Creek, Tenmile Creek, Little Tenmile Creek, Simpson Creek, Limestone Run, and Gnatty Creek were obtained from topographic maps at a scale of 1:4,000 with a contour interval of 4 feet (Reference 6). Cross-section data for Elk Creek from its confluence the West Fork River to stream mile 7 were taken from the Flood Insurance Study for the City of Clarksburg (Reference 7). From stream mile 7 to the county boundary, cross-section data were obtained from topographic

maps at a scale of 1:4,800 with a contour interval of 4 feet (Reference 6). All bridges were field surveyed to obtain elevation data and structural geometry.

Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles (Exhibit 1). For stream segments for which a floodway was computed (Section 4.2), selected cross-section locations are also shown on the Flood Insurance Rate Map (Exhibit 2).

Water-surface elevations of floods of the selected recurrence intervals were computed using the COE HEC-2 step-backwater computer program (Reference 8). Flood profiles were drawn showing computed water-surface elevations for floods of the selected recurrence intervals.

Starting water-surface elevations for the West Fork River were obtained from a continuation of profiles started at the confluence with the Monongahela River at Fairmont. Starting water-surface elevations for Bingamon Creek, Tenmile Creek, Simpson Creek, and Limestone Run were based on critical depth. Starting water-surface elevations for Little Tenmile Creek, Elk Creek, and Gnatty Creek were based on coincidental flooding with Tenmile Creek, the West Fork River, and Elk Creek, respectively.

Roughness coefficients (Manning's "n") used in the hydraulic computations for the streams studied by detailed methods were chosen based on field inspection. The West Fork River, Tenmile Creek, Little Tenmile Creek, Simpson Creek, and Gnatty Run also used verification of roughness requirements to reproduce profiles for known floods for which high-water marks were obtained and flow quantities were measured or easily calculated. For the West Fork River, the well defined floods of July 1988, March 1963, March 1967, May 1968, and November 1973 were verified. For Tenmile Creek, the well-defined floods of March 1963 and November 1985 were verified. For Little Tenmile Creek and Gnatty Creek, the well-defined flood of November 1985 was verified. For Simpson Creek, the well-defined flood of September 1971 was verified. Channel and overbank "n" values for the streams studied by detailed methods are shown in the following tabulation:

<u>Stream</u>	<u>Channel "n"</u>	<u>Overbank "n"</u>
West Fork River	0.030 - 0.050	0.080 - 0.100
Bingamon Creek	0.020 - 0.050	0.065 - 0.090
Tenmile Creek	0.045 - 0.050	0.040 - 0.090
Little Tenmile Creek	0.040	0.040 - 0.080
Simpson Creek	0.045	0.050 - 0.090
Limestone Run	0.015 - 0.040	0.020 - 0.060
Elk Creek	0.030 - 0.045	0.050 - 0.060
Gnatty Creek	0.030 - 0.035	0.060

The hydraulic analyses for this study were based on unobstructed flow. The flood elevations shown on the profiles are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

All elevations are referenced to the National Geodetic Vertical Datum of 1929 (NGVD). Elevation reference marks used in this study are shown on the maps; the descriptions of the marks are presented in Elevation Reference Marks (Exhibit 3).

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

The NFIP encourages State and local governments to adopt sound floodplain management programs. Therefore, each Flood Insurance Study provides 100-year flood elevations and delineations of the 100- and 500-year floodplain boundaries and 100-year floodway to assist communities in developing floodplain management measures.

4.1 Floodplain Boundaries

To provide a national standard without regional discrimination, the 1 percent annual chance (100-year) flood has been adopted by FEMA as the base flood for floodplain management purposes. The 0.2 percent annual chance (500-year) flood is employed to indicate additional areas of flood risk in the community. For the streams studied in detail, the 100- and 500-year floodplain boundaries have been delineated using the flood elevations determined at each cross section. Between cross sections, the boundaries were interpolated using topographic maps at a scale of 1:4,800 with a contour interval of 4 feet (Reference 6).

For the streams studied by approximate methods, the 100-year flood boundaries were delineated using field investigation, topographic maps, and the Flood Hazard Boundary Map for the unincorporated areas of Harrison County (References 6 and 9).

The 100- and 500-year floodplain boundaries are shown on the Flood Insurance Rate Map (Exhibit 2). On this map, the 100-year floodplain boundary corresponds to the boundary of the areas of special flood hazards (Zone A and AE), and the 500-year floodplain boundary corresponds to the boundary of areas of moderate flood hazards. In cases where the 100- and 500-year floodplain boundaries are close together, only the 100-year floodplain boundary has been shown. Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

For the streams studied by approximate methods, only the 100-year floodplain boundary is shown on the Flood Insurance Rate Map (Exhibit 2).

4.2 Floodways

Encroachment on floodplains, such as structures and fill, reduces flood-carrying capacity, increases flood heights and velocities, and increases flood hazards in areas beyond the encroachment itself. One aspect of floodplain management involves balancing the economic gain from floodplain development against the resulting increase in flood hazard. For purposes of the National Flood Insurance Program, a floodway is used as a tool to assist local communities in this aspect of floodplain management. Under this concept, the area of the 100-year floodplain is divided into a floodway and a floodway fringe. The floodway is the channel of a stream, plus any adjacent floodplain areas, that must be kept free of encroachment so that the 100-year flood can be carried without substantial increases in flood heights. Minimum federal standards limit such increases to 1.0 foot, provided that hazardous velocities are not produced. The floodways in this study are presented to local agencies as minimum standards that can be adopted directly or that can be used as a basis for additional floodway studies.

The floodways presented in this study were computed for certain stream segments on the basis of equal conveyance reduction from each side of the floodplain. Floodway widths were computed at cross sections. Between cross sections, the floodway boundaries were interpolated. The results of the floodway computations are tabulated for selected cross sections (Table 2). The computed floodways are shown on the Flood Insurance Rate Map (Exhibit 2). In cases where the floodway and 100-year floodplain boundaries are either close together or collinear, only the floodway boundary is shown. Portions of the floodway widths for the West Fork River, Binghamon Creek, Simpson Creek, and Elk Creek extend beyond the corporate limits.

The area between the floodway and 100-year floodplain boundaries is termed the floodway fringe. The floodway fringe encompasses the portion of the floodplain that could be completely obstructed without increasing the water-surface elevation of the 100-year flood by more than 1.0 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to floodplain development are shown in Figure 2.

Near the mouths of streams studied in detail, floodway computations are made without regard to flood elevations on the receiving water body. Therefore, "Without Floodway" elevations presented in Table 2 for certain downstream cross sections of Binghamon Creek, Tenmile Creek, and Simpson Creek are lower than the regulatory flood elevations in that area, which must take into account the 100-year flooding due to backwater from other sources.

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY (FEET NGVD)	WITH FLOODWAY	INCREASE
West Fork River								
A	11.07	353	8,686	5.5	901.9	901.9	902.9	1.0
B	11.69	305	8,239	5.8	903.3	903.3	904.2	0.9
C	12.15	342	9,067	5.3	904.6	904.6	905.5	0.9
D	12.72	303	8,508	5.6	905.4	905.4	906.2	0.8
E	13.56	243 ²	6,668	7.2	906.9	906.9	907.6	0.7
F	16.04	246	7,005	6.9	913.6	913.6	914.1	0.5
G	16.87	283	6,217	7.7	915.8	915.8	916.2	0.4
H	18.14	340	8,467	4.2	920.1	920.1	920.4	0.3
I	19.15	288	7,595	4.7	921.6	921.6	921.9	0.3
J	19.55	235	6,547	5.5	922.1	922.1	922.5	0.4
K	20.81	302	7,850	4.6	924.2	924.2	924.6	0.4
L	21.53	240	6,450	5.5	925.5	925.5	925.9	0.4
M	23.37	286	7,137	4.0	928.5	928.5	929.3	0.8
N	23.89	263	6,760	4.2	929.4	929.4	930.2	0.8
O	25.59	227	6,712	4.3	932.7	932.7	933.4	0.7
P	26.31	257	6,700	4.3	933.9	933.9	934.6	0.7
Q	27.37	230	6,034	4.7	935.9	935.9	936.7	0.8
R	28.07	210	5,779	4.9	937.6	937.6	938.3	0.7
S	34.80	177	4,120	4.4	947.8	947.8	948.8	1.0
T	36.14	147	3,070	5.9	950.1	950.1	951.0	0.9
U	37.03	234	5,222	3.4	952.2	952.2	953.0	0.8
V	38.48	222	4,944	3.6	955.1	955.1	956.0	0.9
W	39.28	193	4,367	4.1	956.1	956.1	957.0	0.9

¹Miles above confluence with Monongahela River

²This width extends beyond county boundary

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY
HARRISON COUNTY, WV
(UNINCORPORATED AREAS)

FLOODWAY DATA

WEST FORK RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
(FEET NGVD)								
West Fork River (continued)								
X	40.78 ¹	160	4,008	4.5	958.3	958.3	959.0	0.7
Y	42.08 ¹	262	4,776	3.8	960.4	960.4	961.1	0.7
Z	44.56 ¹	208	4,076	4.4	965.5	965.5	965.8	0.3
AA	46.37 ¹	218	4,243	4.2	969.4	969.4	969.6	0.2
AB	47.45 ¹	180	3,585	5.0	971.9	971.9	972.1	0.2
AC	49.06 ¹	202	3,799	4.7	977.6	977.6	977.8	0.2
AD	50.52 ¹	618	7,473	2.4	981.3	981.3	981.9	0.6
AE	51.82 ¹	672	9,560	1.9	982.6	982.6	983.3	0.7
AF	52.81 ¹	280	4,856	3.7	983.6	983.6	984.2	0.6
AG	54.43 ¹	281	5,155	3.5	986.5	986.5	987.4	0.9
AH	55.72 ¹	182	4,140	4.3	989.2	989.2	990.2	1.0
AI	57.00 ¹	190	3,889	2.9	991.9	991.9	992.7	0.8
Bingamon Creek								
A	485 ²	121 ³	1,109	5.5	901.9	885.0 ⁴	885.0	0.0
B	2,955 ²	123 ³	1,222	5.0	901.9	890.7 ⁴	891.1	0.4
C	5,805 ²	140 ³	941	6.4	901.9	895.9 ⁴	896.3	0.4
D	9,970 ²	131	1,507	3.5	907.5	907.5	908.2	0.7
E	12,925 ²	127	1,105	4.7	910.4	910.4	911.3	0.9
F	15,745 ²	104	938	5.6	919.7	919.7	920.1	0.4
G	18,100 ²	96	1,047	5.0	925.2	925.2	925.7	0.5
H	21,600 ²	160	1,929	2.7	928.9	928.9	929.9	1.0

¹Miles above confluence with Monongahela River

²Feet above confluence with West Fork River

³This width extends beyond county boundary

⁴Elevation computed without consideration of
backwater effects from West Fork River

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

HARRISON COUNTY, WV

(UNINCORPORATED AREAS)

FLOODWAY DATA

WEST FORK RIVER - BINGAMON CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY (FEET NGVD)	WITH FLOODWAY	INCREASE
Bingamon Creek (continued)								
I	24,950	119	1,187	4.4	931.5	931.5	932.4	0.9
J	27,965	137	977	5.4	936.4	936.4	937.4	1.0
K	30,185	96	877	6.0	943.9	943.9	944.9	1.0
L	33,175	84	803	6.5	954.5	954.5	954.5	0.0
M	36,045	101	1,149	4.6	960.6	960.6	960.9	0.3
N	37,690	136	1,437	3.6	962.1	962.1	962.7	0.6
O	41,265	89	1,111	4.7	967.8	967.8	938.1	0.3
P	44,095	190	2,181	2.4	969.2	969.2	969.7	0.5
Q	45,625	149	1,377	3.1	969.7	969.7	970.6	0.9
R	47,450	102	1,105	3.9	970.6	970.6	971.5	0.9
S	51,005	150	1,520	2.8	973.4	973.4	974.2	0.8
T	53,210	124	1,007	4.3	977.8	977.8	978.4	0.6
U	56,830	147	1,203	3.6	981.1	981.1	982.0	0.9
V	59,600	118	958	4.5	989.5	989.5	989.9	0.4
W	62,450	145	1,000	4.3	992.9	992.9	993.7	0.8
Tenmile Creek								
A	8,940	134	2,560	5.0	920.0	917.9 ²	918.5	0.6
B	12,330	165	2,917	4.4	920.9	920.9	921.8	0.9
C	14,000	162	2,986	4.3	922.4	922.4	923.3	0.9
D	16,675	130	2,534	5.0	924.3	924.3	925.3	1.0
E	20,660	150	3,089	4.1	927.7	927.7	928.7	1.0

¹Feet above confluence with West Fork River

²Elevation computed without consideration of backwater effects from West Fork River

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

HARRISON COUNTY, WV

(UNINCORPORATED AREAS)

FLOODWAY DATA

BINGAMON CREEK - TENMILE CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY (FEET NGVD)	WITH FLOODWAY	INCREASE
Tenmile Creek (continued)								
F	22,755	145	2,869	4.5	930.6	930.6	931.6	1.0
G	23,885	242	4,235	3.0	931.7	931.7	932.7	1.0
H	24,890	410	6,345	2.0	932.1	932.1	933.1	1.0
I	26,175	577	5,378	1.9	932.4	932.4	933.3	0.9
J	29,050	179	2,910	3.5	934.4	934.4	935.1	0.7
K	33,380	205	2,588	4.0	938.0	938.0	938.8	0.8
L	35,940	115	1,891	5.4	939.6	939.6	940.6	1.0
M	38,625	340	7,248	3.2	943.0	943.0	944.0	1.0
N	40,280	165	2,331	4.4	944.6	944.6	945.4	0.8
O	42,805	200	2,600	3.9	946.6	946.6	947.2	0.6
P	45,045	155	2,402	4.3	947.8	947.8	948.7	0.9
Q	49,035	210	3,094	3.3	953.3	953.3	954.2	0.9
R	51,965	250	3,207	3.2	956.7	956.7	957.5	0.8
S	54,885	134	2,115	4.9	961.0	961.0	961.9	0.9
T	57,635	138	2,325	4.4	963.1	963.1	964.0	0.9
U	60,110	167	2,671	3.8	964.6	964.6	965.6	1.0
V	63,100	150	1,944	4.6	967.3	967.3	968.3	1.0
W	67,175	136	2,096	4.3	970.5	970.5	971.4	0.9
X	71,275	240	2,867	3.1	972.5	972.5	973.5	1.0
Y	75,230	223	2,511	3.2	974.5	974.5	975.5	1.0
Z	77,865	184	2,329	3.4	976.5	976.5	977.5	1.0
AA	80,465	150	2,123	3.8	980.5	980.5	981.3	0.8

¹Feet above confluence with West Fork River

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

HARRISON COUNTY, WV
(UNINCORPORATED AREAS)

FLOODWAY DATA

TENMILE CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY (FEET NGVD)	WITH FLOODWAY	INCREASE
Tenmile Creek (continued)								
AB	83,355 ¹	140	1,720	4.7	983.7	983.7	984.7	1.0
AC	87,485 ¹	130	1,870	4.3	990.3	990.3	991.0	0.7
AD	90,940 ¹	130	1,260	5.2	993.3	993.3	994.1	0.8
AE	93,525 ¹	100	1,057	6.2	998.6	998.6	999.3	0.7
AF	96,440 ¹	130	1,641	4.0	1,003.6	1,003.6	1,004.5	0.9
Little Tenmile Crsek								
A	470 ²	200	1,247	3.7	932.4	922.8 ³	923.8	1.0
B	1,860 ²	80	1,017	4.5	933.5	929.2 ³	929.2	0.0
C	3,610 ²	160	1,897	2.4	934.3	931.1 ³	931.2	0.1
D	5,050 ²	160	1,551	2.9	934.4	931.2 ³	931.5	0.3
E	6,640 ²	100	1,120	4.1	936.5	934.7 ³	935.2	0.5
F	8,560 ²	90	928	4.9	938.6	938.1 ³	938.3	0.2
G	10,920 ²	130	935	4.9	942.9	942.9	943.2	0.3
H	13,380 ²	80	780	5.9	949.7	949.7	950.1	0.4
I	14,910 ²	86	782	5.8	955.0	955.0	955.4	0.4
J	17,180 ²	71	650	7.0	959.4	959.4	960.0	0.6
K	18,990 ²	91	784	5.8	964.5	964.5	964.9	0.4
L	20,860 ²	84	610	7.5	968.5	968.5	969.3	0.8
M	23,260 ²	80	681	6.7	975.5	975.5	975.7	0.2
N	25,460 ²	112	1,154	3.5	980.4	980.4	980.5	0.1

¹Feet above confluence with West Fork River

²Feet above confluence with Tenmile Creek

³Elevation computed without consideration of coincident peak flooding with Tenmile Creek

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

HARRISON COUNTY, WV
(UNINCORPORATED AREAS)

FLOODWAY DATA

TENMILE CREEK - LITTLE TENMILE CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY (FEET NGVD)	WITH FLOODWAY	INCREASE
Little Tenmile Creek (continued)								
O	27,430 ¹	93	828	4.9	984.2	984.2	984.9	0.7
P	29,810 ¹	89	850	4.7	988.8	988.8	989.1	0.3
Q	31,020 ¹	63	393	10.3	989.5	989.5	990.1	0.6
R	33,500 ¹	76	740	5.4	997.7	997.7	998.2	0.5
S	36,630 ¹	175	1,766	2.3	1,002.9	1,002.9	1,003.6	0.7
T	37,850 ¹	325	2,831	1.4	1,003.1	1,003.1	1,003.8	0.7
U	40,670 ¹	150	1,420	2.8	1,006.1	1,006.1	1,006.5	0.4
V	42,250 ¹	150	1,101	3.7	1,006.7	1,006.7	1,007.3	0.6
W	44,870 ¹	159	1,202	3.4	1,008.1	1,008.1	1,008.8	0.7
X	46,640 ¹	98	886	4.6	1,011.3	1,011.3	1,012.0	0.7
Y	47,730 ¹	100	797	5.1	1,012.8	1,012.8	1,013.5	0.7
Z	49,320 ¹	92	623	4.7	1,016.6	1,016.6	1,016.8	0.2
AA	50,490 ¹	140	1,129	2.6	1,018.5	1,018.5	1,019.4	0.9
AB	51,650 ¹	160	1,182	2.5	1,018.9	1,018.9	1,019.9	1.0
AC	52,980 ¹	130	815	3.6	1,019.6	1,019.6	1,020.6	1.0
Simpson Creek								
A	480 ²	127	1,257	6.6	926.9	907.7 ³	907.7	0.0
B	2,240 ²	119	1,258	6.6	926.9	910.6 ³	910.6	0.0
C	3,570 ²	111	1,323	6.2	926.9	913.2 ³	913.3	0.1
D	5,350 ²	122	1,477	5.6	926.9	915.4 ³	915.7	0.3

¹Feet above confluence with Tenmile Creek

²Feet above confluence with West Fork River

³Elevation computed without consideration of backwater effects from West Fork River

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

HARRISON COUNTY, WV
(UNINCORPORATED AREAS)

FLOODWAY DATA

LITTLE TENMILE CREEK - SIMPSON CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY (FEET NGVD)	WITH FLOODWAY	INCREASE
Simpson Creek (continued)								
E	7,000	119	1,077	7.7	926.9	917.5 ³	918.3	0.8
F	10,210	135	1,397	5.9	926.9	925.2 ³	925.6	0.4
G	12,580	129	1,158	7.1	930.7	930.7	931.4	0.7
H	14,610	125	1,061	7.8	935.5	935.5	935.8	0.3
I	17,560	111	1,288	6.4	943.1	943.1	943.3	0.2
J	20,380	129	1,609	5.1	945.8	945.8	946.2	0.4
K	23,170	110	1,315	6.8	948.8	948.8	949.3	0.5
L	25,870	160	2,556	3.2	950.5	950.5	951.5	1.0
M	28,380	150	2,103	3.9	951.5	951.5	952.4	0.9
N	31,060	150	2,190	3.8	952.9	952.9	953.7	0.8
O	34,000	148	2,041	4.0	955.0	955.0	955.8	0.8
P	35,500	151	1,861	4.4	956.0	956.0	956.7	0.7
Q	39,710	190	2,271	3.4	961.9	961.9	962.4	0.5
R	41,830	175	1,845	4.2	963.5	963.5	964.1	0.6
S	57,220	104 ²	1,711	3.5	977.6	977.6	978.5	0.9
T	60,070	396 ²	3,717	1.6	978.7	978.7	979.6	0.9
U	62,680	200	1,443	4.2	979.5	979.5	980.5	1.0
V	65,310	399	3,439	1.7	980.8	980.8	981.7	0.9
W	68,130	77	961	6.2	982.3	982.3	983.2	0.9
X	69,480	140	1,418	4.2	984.1	984.1	985.0	0.9
Y	72,030	125	1,115	5.4	987.2	987.2	987.7	0.5
Z	74,670	143	1,227	4.9	990.3	990.3	991.2	0.9

¹Feet above confluence with West Fork River

²Width extends beyond county boundary

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

HARRISON COUNTY, WV

(UNINCORPORATED AREAS)

FLOODWAY DATA

SIMPSON CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY (FEET NGVD)	WITH FLOODWAY	INCREASE
Simpson Creek (continued)								
AA	77,500 ¹	132	1,322	3.4	993.9	993.9	994.7	0.8
AB	80,020 ¹	83	1,096	4.1	995.8	995.8	996.6	0.8
Limestone Run								
A	3,935 ¹	40	331	7.4	950.7	950.7	951.3	0.6
B	6,715 ¹	100	679	3.6	967.3	967.3	968.3	1.0
C	8,755 ¹	40	368	6.7	974.8	974.8	974.8	0.0
D	11,310 ¹	59	338	6.2	982.2	982.2	982.8	0.6
E	14,585 ¹	159	750	2.3	990.1	990.1	991.0	0.9
F	16,825 ¹	70	335	5.2	997.0	997.0	997.9	0.9
G	19,180 ¹	79	545	3.2	1,010.6	1,010.6	1,011.4	0.8
H	22,025 ¹	50	195	8.9	1,022.0	1,022.0	1,022.6	0.6
I	25,025 ¹	52	213	8.2	1,042.3	1,042.3	1,043.0	0.7
J	27,520 ¹	60	192	9.1	1,067.7	1,067.7	1,067.8	0.1
Elk Creek								
A	3.68 ²	95 ³	2,039	8.2	964.1	964.1	964.7	0.6
B	5.33 ²	215 ³	4,135	3.2	968.0	968.0	968.8	0.8
C	6.29 ²	153 ³	2,289	5.7	969.9	969.9	970.9	1.0
D	6.96 ²	159 ³	2,574	5.1	973.2	973.2	973.3	0.1
E	7.84 ²	350	4,594	2.9	976.7	976.7	977.7	1.0
F	8.45 ²	165	2,101	5.2	977.9	977.9	978.9	1.0

¹Feet above confluence with West Fork River

²Miles above confluence with West Fork River

³This width extends beyond county boundary

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

HARRISON COUNTY, WV
(UNINCORPORATED AREAS)

FLOODWAY DATA

SIMPSON CREEK - LIMESTONE RUN - ELK CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY (FEET NGVD)	WITH FLOODWAY	INCREASE
Elk Creek (continued)								
G	8.93	144	1,743	6.3	981.5	981.5	982.4	0.9
H	9.50	185	2,534	4.3	983.8	983.8	984.4	0.6
I	10.17	243	1,907	5.7	986.1	986.1	986.5	0.4
J	10.97	142	1,911	5.7	989.1	989.1	989.7	0.6
K	11.67	157	1,780	6.1	992.2	992.2	992.9	0.7
L	12.43	230	1,784	6.1	1,004.8	1,004.8	1,005.1	0.3
M	13.03	212	1,975	5.5	1,009.4	1,009.4	1,009.9	0.5
N	13.47	523	2,439	4.5	1,011.0	1,011.0	1,011.8	0.8
O	14.08	1,280	3,465	3.1	1,012.3	1,012.3	1,013.2	0.9
P	14.36	290	1,852	5.9	1,013.2	1,013.2	1,014.0	0.8
Q	14.62	901	7,260	1.5	1,014.9	1,014.9	1,015.4	0.5
R	14.88	658	6,511	1.7	1,015.1	1,015.1	1,015.6	0.5
S	15.29	148	1,077	5.3	1,015.3	1,015.3	1,015.9	0.6
T	15.67	269	1,540	3.7	1,017.1	1,017.1	1,017.6	0.5
U	16.22	245	8,707	0.7	1,018.7	1,018.7	1,019.0	0.3
V	16.56	234	1,510	3.8	1,019.6	1,019.6	1,020.2	0.6
W	16.95	374	2,654	2.1	1,020.5	1,020.5	1,021.4	0.9
X	17.31	513	1,904	3.0	1,021.5	1,021.5	1,022.4	0.9
Y	17.71	223	1,516	3.7	1,023.6	1,023.6	1,024.1	0.5

¹Miles above confluence with West Fork River

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

HARRISON COUNTY, WV

(UNINCORPORATED AREAS)

FLOODWAY DATA

ELK CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY (FEET NGVD)	WITH FLOODWAY	INCREASE
Gnatty Creek								
A	310	69	574	9.1	1,015.2	1,011.0 ²	1,012.0	1.0
B	1,960	530	2,339	2.2	1,015.7	1,014.8 ²	1,015.8	1.0
C	3,340	190	1,161	4.5	1,016.3	1,015.7 ²	1,016.4	0.7
D	5,960	250	1,474	3.5	1,018.2	1,018.1 ²	1,018.7	0.6
E	8,585	210	1,396	3.7	1,020.0	1,020.0 ²	1,020.5	0.5
F	10,150	190	1,689	2.4	1,022.0	1,021.9 ²	1,022.6	0.7
G	14,635	450	2,596	1.6	1,023.9	1,023.9	1,024.5	0.6
H	17,350	191	1,428	2.9	1,025.3	1,025.3	1,025.9	0.6
I	20,500	285	1,775	2.3	1,026.8	1,026.8	1,027.5	0.7
J	24,990	325	1,886	2.2	1,030.9	1,030.9	1,031.5	0.6
K	26,070	210	1,177	3.5	1,031.3	1,031.3	1,032.0	0.7
L	28,000	517	3,605	1.1	1,033.3	1,033.3	1,034.3	1.0
M	29,300	440	2,582	1.6	1,033.7	1,033.7	1,034.6	0.9
N	34,725	377	1,992	1.6	1,038.4	1,038.4	1,039.3	0.9
O	36,920	500	2,450	1.3	1,040.5	1,040.5	1,040.9	0.4
P	38,550	250	1,024	3.1	1,041.4	1,041.4	1,042.1	0.7

¹Feet above confluence with Elk Creek

²Elevation computed without consideration of coincident peak flooding with Elk Creek

TABLE 2

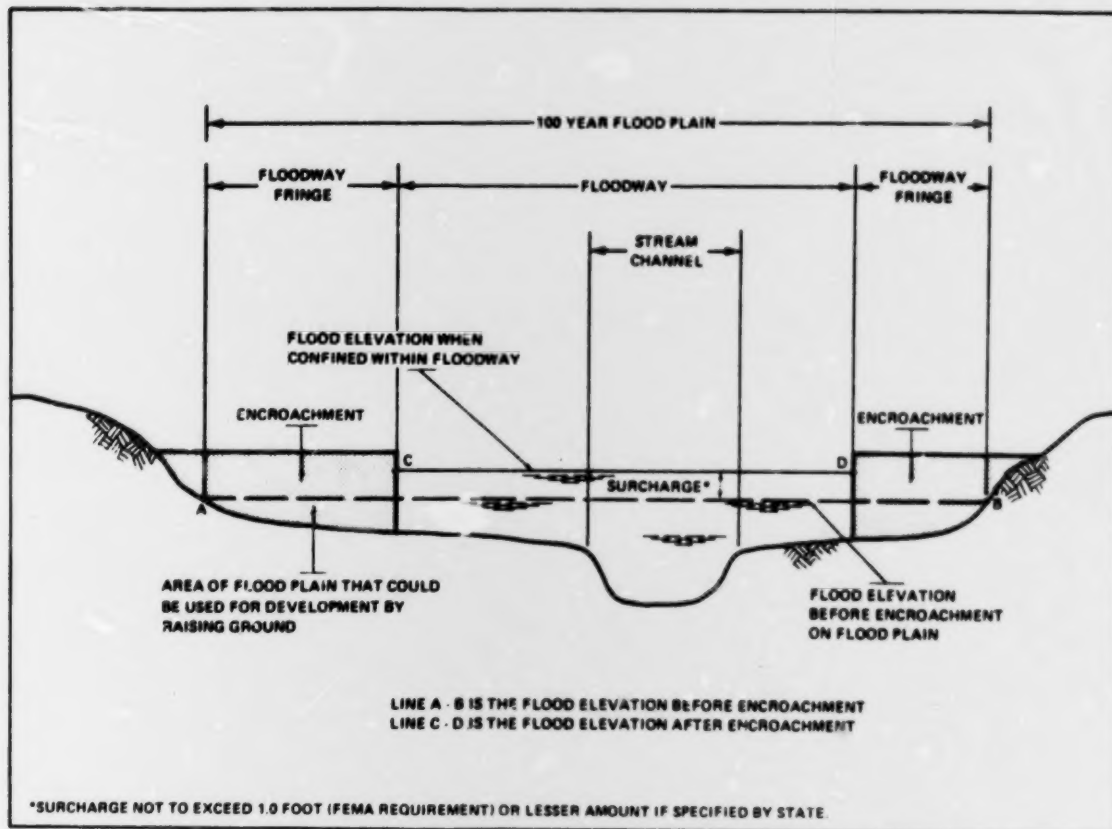
FEDERAL EMERGENCY MANAGEMENT AGENCY

HARRISON COUNTY, WV

(UNINCORPORATED AREAS)

FLOODWAY DATA

GNATTY CREEK



FLOODWAY SCHEMATIC

Figure 2

5.0 INSURANCE APPLICATION

For flood insurance rating purposes, flood insurance zone designations are assigned to a community based on the results of the engineering analyses. These zones are as follows:

Zone A

Zone A is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no base flood elevations or depths are shown within this zone.

Zone AE

Zone AE is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study by detailed methods. In most instances, whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AH

Zone AH is the flood insurance rate zone that corresponds to the areas of 100-year shallow flooding (usually areas of ponding) where average depths are between 1 and 3 feet. Whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AO

Zone AO is the flood insurance rate zone that corresponds to the areas of 100-year shallow flooding (usually sheet flow on sloping terrain) where average depths are between 1 and 3 feet. Average whole-foot depths derived from the detailed hydraulic analyses are shown within this zone.

Zone A99

Zone A99 is the flood insurance rate zone that corresponds to areas of the 100-year floodplain that will be protected by a Federal flood protection system where construction has reached specified statutory milestones. No base flood elevations or depths are shown within this zone.

Zone V

Zone V is the flood insurance rate zone that corresponds to the 100-year coastal floodplains that have additional hazards associated with storm waves. Because approximate hydraulic analyses are performed for such areas, no base flood elevations are shown within this zone.

Zone VE

Zone VE is the flood insurance rate zone that corresponds to the 100-year coastal floodplains that have additional hazards associated with storm waves. Whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone X

Zone X is the flood insurance rate zone that corresponds to areas outside the 500-year floodplain, areas within the 500-year floodplain, and to areas of 100-year flooding where average depths are less than 1 foot, areas of 100-year flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 100-year flood by levees. No base flood elevations or depths are shown within this zone.

Zone D

Zone D is the flood insurance rate zone that corresponds to unstudied areas where flood hazards are undetermined, but possible.

6.0 FLOOD INSURANCE RATE MAP

The Flood Insurance Rate Map is designed for flood insurance and floodplain management applications.

For flood insurance applications, the map designates flood insurance rate zones as described in Section 5.0 and, in the 100-year floodplains that were studied by detailed methods, shows selected whole-foot base flood elevations or average depths. Insurance agents use the zones and base flood elevations in conjunction with information on structures and their contents to assign premium rates for flood insurance policies.

For floodplain management applications, the map shows by tints, screens, and symbols, the 100- and 500-year floodplains. Floodways and the locations of selected cross sections used in the hydraulic analyses and floodway computations are shown where applicable.

7.0 OTHER STUDIES

The COE published a Flood Plain Information Report for the City of Clarksburg and Harrison County (References 10 and 11). The Clarksburg report concerns the flooding of the West Fork River and Elk Creek within Clarksburg. The Harrison County report concerns flooding of the West Fork River within Harrison County.

The Soil Conservation Service (SCS) has prepared a report for the Elk Creek watershed (Reference 12). That report proposes construction of 12 floodwater retarding dams and one floodwater retarding and recreation dam; however, presently there is no existing proposal to build these structures.

Flood Insurance Studies for the City of Clarksburg, and the Towns of Stonewood and Nutter Fork have been published (References 7, 13, and 14). The frequency flood elevations for Elk Creek through the Towns of Stonewood and Nutter Fork are approximately 1 foot higher than those in this study. This difference is attributed to the different programs used in determining the water-surface elevations along this stream. The previous water-surface elevations for the Towns of Stonewood and Nutter Fork were computed using the SCS WSP-2 computer program. The 100-year flood elevation for the West Fork River in this study is 1 to 2 feet lower than the Clarksburg, Stonewood, and Nutter Fork studies. This is due to the fact that this study takes into consideration the flood reductions from the Stonewall Jackson Dam Flood Control Project, which is located approximately 16 miles upstream from the upstream study area.

Flood Insurance Studies for the Cities of Bridgeport and Shinnston, and the Town of Lumberport are currently being prepared (References 15, 16, and 17). The results of those studies will be in agreement with the results of this study.

Flood Insurance Studies for the Town of Anmoore and the City of Salem have been published (References 18 and 19). The results of this study are in agreement with the results of the Salem study. This study is not in agreement with the Anmoore study because Ann Moore Run was studied by approximate methods in this study and by detailed methods in the Anmoore study.

Due to its more detailed nature, this study supersedes the Flood Hazard Boundary Map for the unincorporated areas of Harrison County (Reference 9).

8.0 LOCATION OF DATA

Information concerning the pertinent data used in preparation of this study can be obtained by contacting FEMA, the Natural and Technological Hazards Division, Liberty Square Building (Second Floor), 105 South Seventh Street, Philadelphia, Pennsylvania 19106.

9.0 BIBLIOGRAPHY AND REFERENCES

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16. Federal Emergency Management Agency, Flood Insurance Study, City of Shinnston, Harrison County, West Virginia (Unpublished).
17. Federal Emergency Management Agency, Flood Insurance Study, Town of Lumberport, Harrison County, West Virginia (Unpublished).
18. Federal Emergency Management Agency, Flood Insurance Study, Town of Anmoore, Harrison County, West Virginia, Washington, D. C., September 3, 1980.
19. Federal Emergency Management Agency, Flood Insurance Study, City of Salem, Harrison County, West Virginia, Washington, D. C., December 4, 1985.

EXHIBIT 3 - ELEVATION REFERENCE MARKS

<u>Reference Mark</u>	<u>FIRM Panel</u>	<u>Elevation (Feet NGVD)</u>	<u>Description of Location</u>
RM 1	8	1,012.98	Chiseled L on downstream right bank abutment wing wall of arch bridge over Little Tenmile Creek, approximately 875 feet upstream of County Route 20-1 over Little Tenmile Creek.
RM 2	8	1,016.95	Chiseled L on downstream right bank parapet corner of concrete arch bridge of County Route 20-1 over Little Tenmile Creek.
RM 3	8	1,036.43	Chiseled L on downstream right bank abutment corner of CSX Transport (B&O) bridge No. 380 over Little Tenmile Creek.
RM 4	8	1,033.64	Chiseled L on upstream left bank abutment corner of CSX Transport (B&O) bridge No. 382 over Little Tenmile Creek.
RM 5	16	1,008.15	Top of curb bolt on upstream left bank side of access road bridge over Little Tenmile Creek, approximately 0.73 mile upstream of County Route 20-2 over Little Tenmile Creek.
RM 6	16	1,029.06	Chiseled L on downstream right bank abutment corner of CSX Transport (B&O) bridge No. 384 over Little Tenmile Creek, approximately 0.57 mile upstream of County Route 20-2 over Little Tenmile Creek.
RM 7	16	1,027.37	Chiseled U on downstream left bank abutment of single lane steel truss bridge of access road over Little Tenmile Creek, approximately 0.30 mile upstream of County Route 20-2 over Little Tenmile Creek.
RM 8	16	1,026.54	Chiseled L on upstream right bank abutment of CSX Transport (B&O) bridge No. 386 immediately downstream of State Route 20 bridge over Little Tenmile Creek, approximately 0.26 mile upstream of County Route 20-2 over Little Tenmile Creek.

EXHIBIT 3 - ELEVATION REFERENCE MARKS (continued)

<u>Reference Mark</u>	<u>FIRM Panel</u>	<u>Elevation (Feet NGVD)</u>	<u>Description of Location</u>
RM 9	16	1,011.17	Chiseled L on top corner of end concrete wall post on downstream left bank side of access road over Little Tenmile Creek, approximately 0.24 mile upstream of County Route 20-2 over Little Tenmile Creek.
RM 10	16	1,006.18	Chiseled L on downstream right bank parapet corner of County Route 20-2 bridge over Little Tenmile Creek.
RM 11	16	1,008.30	Chiseled L on upstream left bank abutment of CSX Transport (B&O) bridge over Little Tenmile Creek, approximately 0.65 mile upstream of County Route 20-27 over Little Tenmile Creek.
RM 12	16	1,003.24	Standard USC&GS disk stamped L23 1935 set in top of concrete post, 1.9 miles southeast of CSX Transport (B&O) station at Wallace, 45 feet southeast of center of road crossing, 25 feet northeast of northeast rail of main track, 95 feet southeast of circular culvert 402 over Jake Run, 10 feet southwest of fence.
RM 13	16	1,000.23	Chiseled L on upstream left bank abutment of County Route 20-27 bridge over Little Tenmile Creek.
RM 14	16	1,000.20	Chiseled L on downstream left bank abutment of CSX Transport (B&O) bridge over Little Tenmile Creek.
RM 15	16	999.26	Chiseled L on upstream left bank abutment corner of County Route 14 bridge over Little Tenmile Creek, at confluence of Mill Run.
RM 16	17	993.10	Chiseled U on downstream right bank abutment of CSX Transport (B&O) bridge over Little Tenmile Creek, downstream of Laurel Run.
RM 17	17	988.92	Chiseled L on downstream right bank abutment corner of County Route 20-36 bridge over Little Tenmile Creek.

EXHIBIT 3 - ELEVATION REFERENCE MARKS (continued)

<u>Reference Mark</u>	<u>FIRM Panel</u>	<u>Elevation (Feet NGVD)</u>	<u>Description of Location</u>
RM 18	17	984.13	Standard USC&GS disk stamped K23 1935 located 3.4 miles southeast along CSX Transport (B&O) from station at Wallace, at bridge #418 over Little Tenmile Creek, in top of northeast side of northwest abutment, and 7 feet north-east of northeast rail.
RM 19	17	979.80	Chiseled U on upstream left bank parapet wall of County Route 22-1 bridge over Little Tenmile Creek.
RM 20	17	978.95	Chiseled U on downstream left bank abutment of CSX Transport (B&O) bridge over Little Tenmile Creek, approximately 0.26 mile downstream of County Route 22/1 over Little Tenmile Creek.
RM 21	17	975.76	Chiseled L on upstream right bank abutment of CSX Transport (B&O) bridge over Little Tenmile Creek, downstream of Caldwell Run.
RM 22	19	965.70	Top of curb bolt on downstream left bank side of County Route 16 bridge over Little Tenmile Creek.
RM 23	19	966.15	Chiseled L on downstream left bank corner of abutment of CSX Transport (B&O) bridge over Little Tenmile Creek, approximately 575 feet downstream of confluence of Bennett Run with Little Tenmile Creek.
RM 24	19	957.22	Chiseled L on upstream right bank abutment of CSX Transport (B&O) bridge over Little Tenmile Creek, approximately 0.81 mile downstream of confluence of Bennett Run with Little Tenmile Creek.
RM 25	19	955.48	Chiseled U on downstream left bank abutment of CSX Transport (B&O) bridge over Little Tenmile Creek, approximately 1.10 miles downstream of confluence of Bennett Run with Little Tenmile Creek.

EXHIBIT 3 - ELEVATION REFERENCE MARKS (continued)

<u>Reference Mark</u>	<u>FIRM Panel</u>	<u>Elevation (Feet NGVD)</u>	<u>Description of Location</u>
RM 26	19	953.10	Chiseled L on upstream right bank abutment corner of CSX Transport (B&O) bridge over Little Tenmile Creek, approximately 0.64 mile upstream of confluence of Peters Run with Little Tenmile Creek.
RM 27	19	947.75	Chiseled U on downstream left bank abutment of CSX Transport (B&O) bridge over Little Tenmile Creek, approximately 0.2 mile upstream of confluence of Peters Run with Little Tenmile Creek.
RM 28	19	933.65	Chiseled U on upstream right bank wing wall of access road bridge over Little Tenmile Creek, approximately 475 feet upstream of confluence of Peters Run with Little Tenmile Creek.
RM 29	26	991.97	Chiseled L on upstream left bank abutment of County Route 3-1 bridge over Bingamon Creek.
RM 30	28	987.95	Standard USGS tablet stamped 130 WBM 988 1957 and painted UEBM 988. located 200 feet west and 80 feet south and 3 feet lower than Y-intersection, 60 feet west of Big Indian Run.
RM 31	28	979.73	Chiseled L on upstream left bank curb of County Route 3-8 bridge over Bingamon Creek.
RM 32	28	974.68	Chiseled U on upstream left bank abutment of access road over Bingamon Creek, approximately 25 feet downstream of confluence of Big Run with Bingamon Creek.
RM 33	28	975.29	Corner of concrete pylon with steel base plate on downstream left bank side of access road over Bingamon Creek, approximately 0.54 mile downstream of confluence of Big Run with Bingamon Creek.

EXHIBIT 3 - ELEVATION REFERENCE MARKS (continued)

<u>Reference Mark</u>	<u>FIRM Panel</u>	<u>Elevation (Feet NGVD)</u>	<u>Description of Location</u>
RM 34	28	965.34	Chiseled L in upstream right bank wing wall of steel truss bridge over Bingamon Creek, approximately 0.83 mile upstream of confluence of Cunningham Run with Bingamon Creek.
RM 35	28	970.76	Chiseled L on center of downstream parapet wall of County Route 8 bridge over Bingamon Creek, approximately 750 feet upstream of confluence of Cunningham Run with Bingamon Creek.
RM 36	29	902.34	Chiseled L on upstream left bank parapet wall of County Route 8 bridge over Little Bingamon Creek.
RM 37	29	917.88	Chiseled L on top of upstream left bank wall of County Route 8/1 bridge over Bingamon Creek.
RM 38	29	919.81	Chiseled L on corner of upstream left bank stone abutment of Coal Plant bridge over Bingamon Creek.
RM 39	33	906.35	Chiseled L on downstream left bank wing wall of U.S. Route 19 bridge over Bingamon Creek.
RM 40	37	949.79	Chiseled L on upstream right bank abutment of County Route 8 bridge over Bingamon Creek, approximately 0.97 mile upstream of County Route 10-4 bridge over Bingamon Creek.
RM 41	37	945.96	Chiseled L on upstream left bank end of parapet wall on County Route 8 bridge over Bingamon Creek, approximately 0.74 mile upstream of County Route 10-4 bridge over Bingamon Creek.
RM 42	37	935.61	Top of lower inside flange of railing on downstream left bank side of access road bridge over Bingamon Creek, approximately 0.32 mile upstream of County Route 10-4 bridge over Bingamon Creek.

EXHIBIT 3 - ELEVATION REFERENCE MARKS (continued)

<u>Reference Mark</u>	<u>FIRM Panel</u>	<u>Elevation (Feet NGVD)</u>	<u>Description of Location</u>
RM 43	37	930.68	Chiseled U on upstream left bank abutment of County Route 10-4 bridge over Bingamon Creek.
RM 44	37	985.05	Railroad spike in northwest side of power pole No. 13 548 at intersection of County Route 8 and Rices Road along Bingamon Creek.
RM 45	37	944.24	Spike in power pole Route 168 on County Route 8, approximately 0.60 mile east of intersection with Bices Road.
RM 46	38	931.89	Chiseled U on downstream parapet wall along centerline of County Route 7 bridge over Little Tenmile Creek.
RM 47	38	934.79	Standard USC&GS disk stamped H23 1935 located 3.3 miles northwest along CSX Transport (B&O) from station at Lumberport; at bridge No. 458 over Little Tenmile Creek, set in center of top of west retaining wall, and 8 feet north of north rail.
RM 48	38	921.13	Chiseled L on upstream right bank abutment of Robey Mines Road bridge over Tenmile Creek.
RM 49	38	926.02	Chiseled L on downstream left bank abutment of Robey Hollow Road bridge over Tenmile Creek.
RM 50	38	933.45	Standard USC&GS disk stamped G23 1935 located 1.8 miles northwest along CSX Transport (B&O) from station at Lumberport, at bridge No. 472 over Tenmile Creek, set in center of top of west retaining wall and 7 feet south of south rail.
RM 51	38	917.17	Chiseled U on upstream right bank abutment of Laura Lee Mine Road bridge over Tenmile Creek.

EXHIBIT 3 - ELEVATION REFERENCE MARKS (continued)

<u>Reference Mark</u>	<u>FIRM Panel</u>	<u>Elevation (Feet NGVD)</u>	<u>Description of Location</u>
RM 52	38	931.93	Chiseled L on headwall at downstream end of right bank abutment of CSX Transport (B&O) bridge over Tenmile Creek, approximately 0.22 mile downstream of Laura Lee Mine Road bridge over Tenmile Creek.
RM 53	38	926.13	Chiseled L on headwall at downstream end of left bank abutment of CSX Transport (B&O) bridge over Tenmile Creek in Lumberport, approximately 525 feet upstream of confluence of Tenmile Creek with the West Fork River.
RM 54	38	959.96	Chiseled L set on downstream right bank concrete curb at base of handrail of State Route 20 bridge over the West Fork River, approximately 0.26 mile downstream of confluence of Tenmile Creek with the West Fork River.
RM 55	39	956.76	Chiseled square painted UE 956.8 located on top of northwest wing wall at north end of U. S. Route 19/State Route 20 bridge over the West Fork River.
RM 56	41	944.49	Chiseled L on upstream left bank corner parapet wall of access road bridge over the West Fork River, approximately 675 feet downstream of Enterprise Highway bridge over the West Fork River.
RM 57	41	900.37	Chiseled L on downstream right bank abutment of Enterprise Highway bridge over the West Fork River.
RM 58	41	906.21	Railroad spike, approximately 2 feet above ground, in power pole U2-030 on east side of U. S. Route 19, approximately 1.11 miles south of U. S. Route 19 and Enterprise Highway intersection.

EXHIBIT 3 - ELEVATION REFERENCE MARKS (continued)

<u>Reference Mark</u>	<u>FIRM Panel</u>	<u>Elevation (Feet NGVD)</u>	<u>Description of Location</u>
RM 59	56	982.24	Chiseled L on downstream left bank wing wall of Indian Run Road bridge over Tenmile Creek.
RM 60	56	978.29	Chiseled L on downstream left bank wing wall of County Route 5 bridge over Tenmile Creek.
RM 61	56	980.36	Chiseled + in left side of downstream left bank pipe support of footbridge over Tenmile Creek, approximately 0.33 mile upstream of Marshville Road bridge over Tenmile Creek.
RM 62	56	973.98	Chiseled X on downstream left bank wing wall of Marshville Road bridge over Grass Run.
RM 63	56	972.28	Chiseled L on downstream left bank abutment of station at Wallace, at bridge #418 over Tenmile Creek, in top of northeast side of northwest abutment, and 7 feet northeast of northeast rail.
RM 64	56	958.91	Chiseled L on upstream left bank base of pipe support for footbridge over Tenmile Creek, approximately 0.71 mile downstream of Marshville Road bridge over Tenmile Creek.
RM 65	56	960.85	Chiseled + in downstream left bank steel pipe wing wall, 1 foot from end of deck of access road bridge over Tenmile Creek, approximately 1.23 miles downstream of Marshville Road bridge over Tenmile Creek.
RM 66	57	962.68	Chiseled L on upstream right bank abutment wing wall of Rockcamp Run Road over Tenmile Creek.
RM 67	57	955.09	Chiseled L on downstream left bank end of stone wing wall of Katy Lick Road bridge over Tenmile Creek, approximately 250 feet upstream of confluence of Flag Run with Tenmile Creek.

EXHIBIT 3 - ELEVATION REFERENCE MARKS (continued)

<u>Reference Mark</u>	<u>FIRM Panel</u>	<u>Elevation (Feet NGVD)</u>	<u>Description of Location</u>
RM 68	57	950.32	Chiseled L on downstream left side of left bank pipe support of footbridge over Tenmile Creek, approximately 0.37 mile downstream of confluence of Flag Run with Tenmile Creek.
RM 69	57	953.41	Chiseled L on downstream right bank abutment corner of Katy Lick Run Road bridge over Tenmile Creek, approximately 175 feet upstream of confluence of Katy Lick Run with Tenmile Creek.
RM 70	57	942.59	Chiseled L at base of downstream left bank wing wall of Gregory Run Road bridge over Tenmile Creek.
RM 71	58	997.17	Chiseled L on downstream right bank wing wall of access road bridge over Tenmile Creek, approximately 240 feet downstream of U. S. Route 50 westbound bridge over Tenmile Creek.
RM 72	58	999.69	Chiseled L on upstream right bank of parapet wall of County Route 5 bridge over Tenmile Creek, approximately 0.37 mile downstream of U. S. Route 50 westbound bridge over Tenmile Creek.
RM 73	58	998.10	Chiseled L on downstream left bank parapet of County Route 5 bridge over Tenmile Creek, approximately 0.58 mile downstream of U. S. Route 50 westbound bridge over Tenmile Creek.
RM 74	58	995.13	Top of metal post on downstream right bank of access road bridge over Tenmile Creek, approximately 0.36 mile upstream of Salem Fork Road bridge over Tenmile Creek.
RM 75	58	996.84	Top of last pipe post on downstream right bank of access road bridge over Tenmile Creek, approximately 0.25 mile upstream of Salem Fork Road bridge over Tenmile Creek.

EXHIBIT 3 - ELEVATION REFERENCE MARKS (continued)

<u>Reference Mark</u>	<u>FIRM Panel</u>	<u>Elevation (Feet NGVD)</u>	<u>Description of Location</u>
RM 76	58	988.58	Chiseled U at parapet base on upstream right bank of Salem Fork Road bridge over Tenmile Creek.
RM 77	58	988.07	Chiseled L on upstream right bank abutment of wing wall of covered bridge over Tenmile Creek, approximately 0.49 mile downstream of Salem Fork Road bridge over Tenmile Creek.
RM 78	59	1,056.53	Chiseled L on downstream right bank corner of downstream parapet wall of access road bridge over small tributary to Limestone Run. Bridge is approximately 125 feet upstream of confluence of small tributary with Limestone Run, confluence is approximately 0.42 mile upstream of County Route 50-10 bridge over Limestone Run.
RM 79	59	1,051.51	Standard US&GS disk along CSX Transport (B&O), 220 feet west of County Route 50-10 crossing railroad tracks, 80 feet south of centerline of tracks. Set in top of large sandstone boulder and four feet lower than track.
RM 80	59	1,040.86	Chiseled L on west corner of northwest wing wall of County Route 50-10 bridge over Limestone Run.
RM 81	59	1,014.94	Chiseled L on west corner of southeast bridge seat of CSX Transport (B&O) spur over Limestone Run, approximately 0.55 mile downstream of County Route 50-10 bridge over Limestone Run.
RM 82	59	1,012.79	Chiseled L on southwest corner of concrete base for signal tower 307 of CSX Transport (B&O), located approximately 0.74 mile east of CSX Transport (B&O) and County Route 50-10 intersection.

EXHIBIT 3 - ELEVATION REFERENCE MARKS (continued)

<u>Reference Mark</u>	<u>FIRM Panel</u>	<u>Elevation (Feet NGVD)</u>	<u>Description of Location</u>
RM 83	59	1,005.27	Standard USC&GS disk in top of north end of west abutment, 22 feet south of centerline of track and two feet lower than track of CSX Transport (B&O) bridge over Limestone Run, approximately 0.96 mile downstream of County Route 50-10 bridge over Limestone Run.
RM 84	59	1,002.58	Mark on top of top bracket for gate on downstream side of access road bridge over Limestone Run, approximately 1.24 miles upstream of Wilsonburg Road bridge over Limestone Run.
RM 85	59	991.54	Chiseled L on southeast corner of old concrete base, 2 feet northwest of northeast corner of footbridge over Limestone Run, approximately 1.01 miles upstream of Wilsonburg Road bridge over Limestone Run.
RM 86	59	989.87	PK nail in top of wooden post on northeast corner of footbridge over Limestone Run, approximately 0.67 mile upstream of Wilsonburg Road bridge over Limestone Run.
RM 87	59	982.81	Chiseled L on southwest corner of southwest abutment of CSX Transport (B&O) spur bridge over Limestone Run, approximately .30 mile upstream of Wilsonburg Road bridge over Limestone Run.
RM 88	59	981.65	Chiseled L on northwest corner of top step on southwest wing wall of Wilsonburg Road bridge over Limestone Run.
RM 89	69	966.77	Chiseled + on corner of northeast abutment of Laurel Park Road bridge over the West Fork River.
RM 90	69	957.28	Chiseled + on corner of stone wing wall of culvert over unnamed tributary to the West Fork River. Tributary located approximately 1.04 mile upstream of Highland Dam. Culvert located approximately 90 feet upstream of confluence of tributary with the West Fork River.

EXHIBIT 3 - ELEVATION REFERENCE MARKS (continued)

<u>Reference Mark</u>	<u>FIRM Panel</u>	<u>Elevation (Feet NGVD)</u>	<u>Description of Location</u>
RM 91	69	984.87	Chiseled L on downstream right bank wing wall of Highland Dam Road bridge over the West Fork River.
RM 92	77	923.03	Standard tablet stamped 68 SKS 1956 923 and painted USBM 923.1 located 133 feet southeast of east end of CSX Transport (B&O) station at Meadowbrook, set in top of southwest concrete abutment of CSX Transport (B&O) bridge over Simpson Creek, approximately 400 feet upstream of confluence of Simpson Creek with the West Fork River.
RM 93	77	918.73	Chiseled L on downstream right corner of abutment of access road bridge over Simpson Creek, approximately 0.42 mile upstream of confluence of Simpson Creek with the West Fork River.
RM 94	77	928.45	Chiseled L on downstream left bank of abutment of CSX Transport (B&O) bridge over Simpson Creek, approximately 1.40 miles upstream of confluence of Simpson Creek with the West Fork River.
RM 95	77	941.53	Chiseled L on downstream right bank abutment of access road bridge over Simpson Creek, approximately 0.38 mile upstream of confluence of Smith Run with Simpson Creek.
RM 96	77	947.62	Chiseled L on downstream left bank abutment of access road bridge over Simpson Creek, approximately 1.58 miles upstream of confluence of Smith Run with Simpson Creek.
RM 97	78	975.25	Chiseled U on northeast corner of west abutment of CSX Transport (B&O) bridge over Limestone Run, approximately 1.34 miles upstream of confluence of Limestone Run with the West Fork River.

EXHIBIT 3 - ELEVATION REFERENCE MARKS (continued)

<u>Reference Mark</u>	<u>FIRM Panel</u>	<u>Elevation (Feet NGVD)</u>	<u>Description of Location</u>
RM 98	78	962.49	Chiseled L on northwest corner of CSX Transport (B&O) bridge over Limestone Run, approximately 1.2 miles upstream of confluence of Limestone Run with the West Fork River.
RM 99	78	964.18	Chiseled U 0.4 foot west of southwest corner of deck of access road bridge over Limestone Run, approximately 1.12 miles upstream of confluence of Limestone Run with the West Fork River.
RM 100	78	965.61	Chiseled L on northwest corner of CSX Transport (B&O) bridge over Limestone Run, approximately 0.98 mile upstream of confluence of Limestone Run with the West Fork River.
RM 101	78	962.03	Chiseled L in top of concrete whistle post, 40 feet west of west abutment of CSX Transport (B&O) bridge over Limestone Run and 9 feet south of south rail, approximately 0.50 mile upstream of confluence of Limestone Run with the West Fork River.
RM 102	78	940.83	Railroad spike painted UE 940.8 located at CSX Transport crossing along the West Fork River, approximately 48 feet east of centerline of crossing, in base of railroad crossing sign post, approximately 0.35 mile west of CSX Transport (B&O) bridge over Fall Run.
RM 103	78	924.78	Standard USGS disk painted UE 924.8 located on top of northwest wing wall of concrete bridge over Fall Run, approximately 250 feet upstream of confluence of Fall Run with the West Fork River.
RM 104	79	944.97	Chiseled L on east end of south concrete wall of bridge over tributary to Simpson Creek. Tributary is approximately 1.36 miles downstream of Barnett Run; reference mark is approximately 50 feet upstream of confluence of tributary with Simpson Creek.

EXHIBIT 3 - ELEVATION REFERENCE MARKS (continued)

<u>Reference Mark</u>	<u>FIRM Panel</u>	<u>Elevation (Feet NGVD)</u>	<u>Description of Location</u>
RM 105	79	952.87	Chiseled L on downstream right bank parapet wall of Arch Road bridge over Simpson Creek.
RM 106	79	954.15	Chiseled L on downstream right bank stone abutment of abandoned Summit Park Road bridge over Simpson Creek.
RM 107	79	958.76	Top of manhole located on right bank of Simpson Creek, approximately 20 feet downstream of access road bridge, and approximately 450 feet upstream of Interstate Route 79 northbound bridge over Simpson Creek.
RM 108	86	957.42	Chiseled L on top of post on southeast corner of County Route 33 bridge over the West Fork River.
RM 109	86	999.94	Railroad spike in power pole 793/4 at CSX Transport (B&O) crossing, located approximately 1.32 miles south along CSX Transport (B&O) from southernmost CSX Transport (B&O) and County Route 33 intersection.
RM 110	86	989.79	Standard USGS tablet stamped 75 SKS 1956 990, located along State Route 20 near Fowlkes Run, 28 feet southwest of centerline of T-intersection east, 3.8 feet northeast of telephone pole and set in top of concrete post.
RM 111	87	971.65	Chiseled L in upstream right corner of upstream right bank wing wall of Cost Avenue bridge over Elk Creek.
RM 112	88	951.05	Chiseled U on southeast concrete abutment of access road.
RM 113	89	976.54	Chiseled + located 30 feet southwest of and 2 feet higher than Y-intersection, on north end of east concrete headwall of culvert located approximately 325 feet along Hooppole Run from confluence with Elk Creek.

EXHIBIT 3 - ELEVATION REFERENCE MARKS (continued)

<u>Reference Mark</u>	<u>FIRM Panel</u>	<u>Elevation (Feet NGVD)</u>	<u>Description of Location</u>
RM 114	89	1,010.15	Chiseled L in top upstream left end of upstream parapet wall of County Route 42 bridge over Elk Creek.
RM 115	89	1,007.44	Chiseled L in top upstream right end of upstream parapet wall of State Route 20 bridge over Elk Creek, bridge approximately 575 feet upstream of County Route 42 bridge over Elk Creek.
RM 116	91	982.86	Chiseled L on upstream right bank abutment of CSX Transport (B&O) bridge over Simpson Creek, bridge approximately 0.45 mile upstream of confluence of Ann Run with Simpson Creek.
RM 117	91	993.96	Disk No. P79 set on upstream right bank abutment of CSX Transport (B&O) bridge over Simpson Creek, bridge approximately 525 feet upstream of confluence of Peddler Run with Simpson Creek.
RM 118	91	993.76	Chiseled L on upstream right bank parapet wall of County Route 17 bridge over Simpson Creek.
RM 119	106	990.582	Standard USGS tablet stamped 71 WSM 1957 Reset 1971 located in east end of north concrete abutment of U. S. Route 19 bridge over the West Fork River; bridge located approximately 725 feet downstream of confluence of Issacs Creek with the West Fork River.
RM 120	106	990.92	Standard USGS disk painted UE 990.9 located on northeast parapet of concrete culvert and 3 feet above U. S. Route 19, approximately 2.32 miles south along U. S. Route 19 from bridge over Buffalo Creek.
RM 121	107	970.87	Chiseled + cut in east side of north abutment of West Milford Dam on the West Fork River.

EXHIBIT 3 - ELEVATION REFERENCE MARKS (continued)

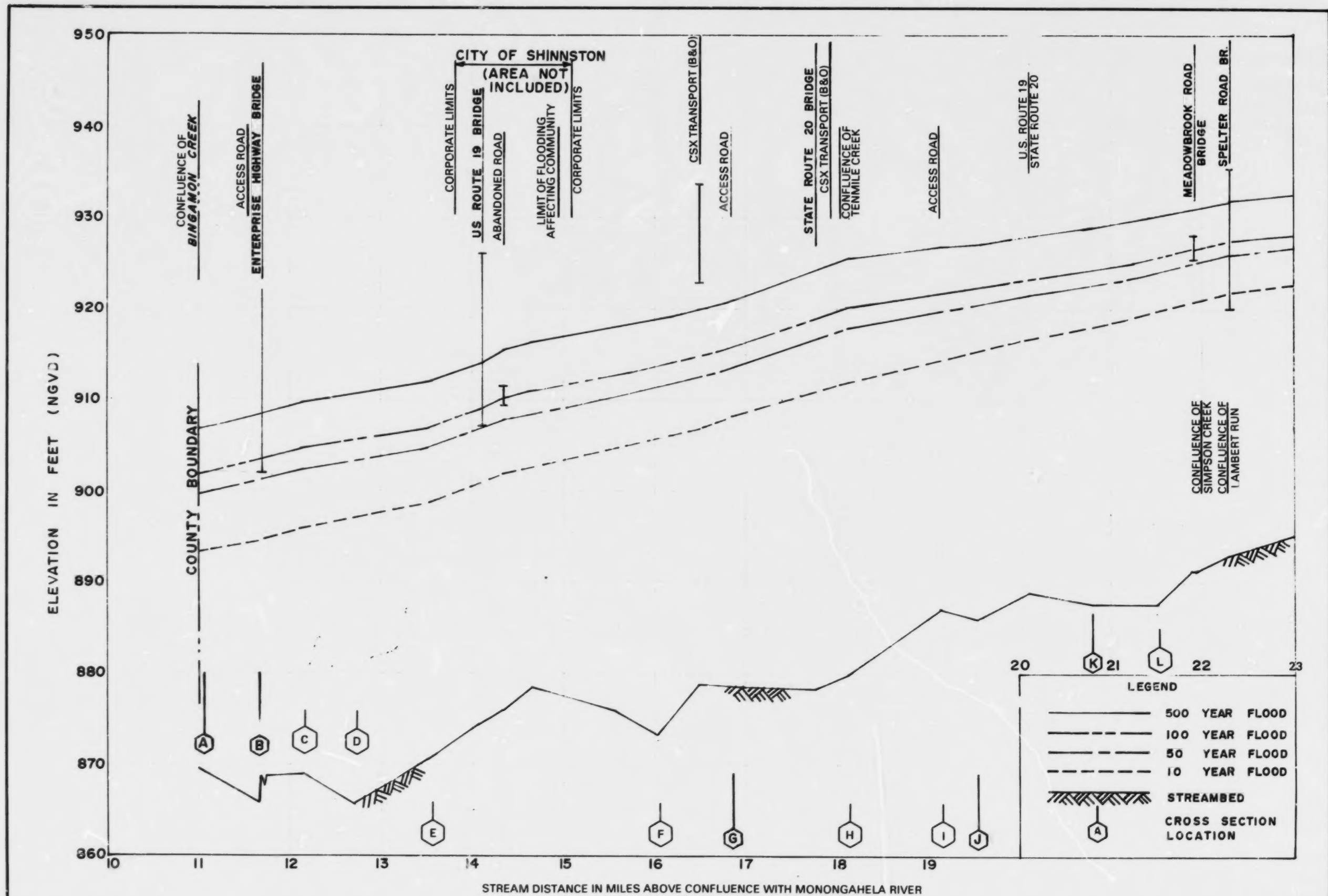
<u>Reference Mark</u>	<u>FIRM Panel</u>	<u>Elevation (Feet NGVD)</u>	<u>Description of Location</u>
RM 122	108	993.14	Chiseled L at base of upstream concrete parapet at right bank end of concrete bridge spanning Kincheloe Creek. Bridge is approximately 0.30 mile upstream of confluence of Kincheloe Creek with the West Fork River.
RM 123	108	999.85	Chiseled L on south end of east concrete headwall of small concrete bridge over unnamed tributary to the West Fork River along State Route 35. Tributary is approximately 0.80 mile downstream of confluence of Kincheloe Creek with the West Fork River.
RM 124	108	995.10	Standard USGS disk stamped 63 WSM 995 1957 set in south end of west abutment of concrete bridge spanning the West Fork River.
RM 125	108	985.53	Chiseled + painted UE 985.5 on south end of east stone abutment of State Route 19-8 bridge over the West Fork River.
RM 126	127	1,038.17	Top of fire hydrant at northeast side of intersection of State Route 20 and access road. Intersection is approximately 65 feet north of Fall Run.
RM 127	127	1,011.32	Chiseled + on upstream left bank end of concrete abutment of Hastings Run Road bridge over Elk Creek.
RM 128	127	1,012.41	Standard USGS tablet stamped 80 WSM 1012 1957 and painted USBM 1012.4 located approximately 275 feet north-east of junction of State Route 44-3 and State Route 20-19, approximately 50 feet west of Hastings Run Road.
RM 129	127	1,008.17	Chiseled L on top upstream left bank concrete wing wall of single land steel Bel Meadow golf course bridge spanning Elk Creek. Bridge is approximately 500 feet upstream of confluence of Hastings Run with Elk Creek.

EXHIBIT 3 - ELEVATION REFERENCE MARKS (continued)

<u>Reference Mark</u>	<u>FIRM Panel</u>	<u>Elevation (Feet NGVD)</u>	<u>Description of Location</u>
RM 130	127	1,010.65	Chiseled L on land end of upstream left bank concrete wing wall of single lane steel Bel Meadow golf course bridge spanning Elk Creek. Bridge is approximately 510 feet downstream of confluence of Stevens Run with Elk Creek.
RM 131	129	1,020.85	Chiseled L on top of right bank concrete abutment at upstream end of steel State Route 20 bridge over Elk Creek. Bridge approximately 0.22 mile upstream of confluence of Gnatty Creek with Elk Creek.
RM 132	129	1,014.20	Chiseled L set on land side of right bank concrete pier at downstream end of steel support suspension footbridge over Gnatty Creek. Bridge approximately 0.96 mile upstream of confluence of Gnatty Creek with Elk Creek.
RM 133	129	1,021.49	Chiseled L on top left bank of concrete abutment at upstream end of single lane steel deck bridge over Gnatty Creek on Lost Creek Road.
RM 134	129	1,014.79	Chiseled L on stone at upstream right bank of access road bridge over Gnatty Creek. Bridge is approximately 0.23 mile upstream of confluence of Rooting Creek with Gnatty Creek.
RM 135	129	1,019.38	Chiseled L set on top of downstream left bank stone wing wall of access road bridge over Gnatty Creek. Bridge is approximately 1.21 miles upstream of confluence of Rooting Creek with Gnatty Creek.
RM 136	133	1,012.50	Chiseled L in downstream right bank stone abutment of access road bridge.
RM 137	133	1,020.36	Standard USGS disk stamped 87 WSM 1020 1957 set in bridge seat on upstream left bank stone abutment of County Route 57-2 bridge spanning Elk Creek.

EXHIBIT 3 - ELEVATION REFERENCE MARKS (continued)

<u>Reference Mark</u>	<u>FIRM Panel</u>	<u>Elevation (Feet NGVD)</u>	<u>Description of Location</u>
RM 138	133	1,026.15	Chiseled L punched in top upstream pipe rail at right bank gate post of access road bridge over Gnatty Creek. Bridge is approximately 850 feet downstream of confluence of Raccoon Creek with Gnatty Creek.
RM 139	141	1,026.23	Nail in top of wood deck over upstream steel beam of access road bridge over Gnatty Creek. Bridge is approximately 0.74 mile upstream of confluence of Raccoon Creek with Gnatty Creek.
RM 140	141	1,026.65	Nail in sandstone abutment at upstream right bank end of access road bridge over Gnatty Creek. Bridge is approximately 1.20 miles upstream of confluence of Raccoon Creek with Gnatty Creek.
RM 141	141	1,034.15	Chiseled L at upstream end of left bank stone abutment of County Route 48 bridge with reinforced concrete deck over Gnatty Creek.



FLOOD PROFILES

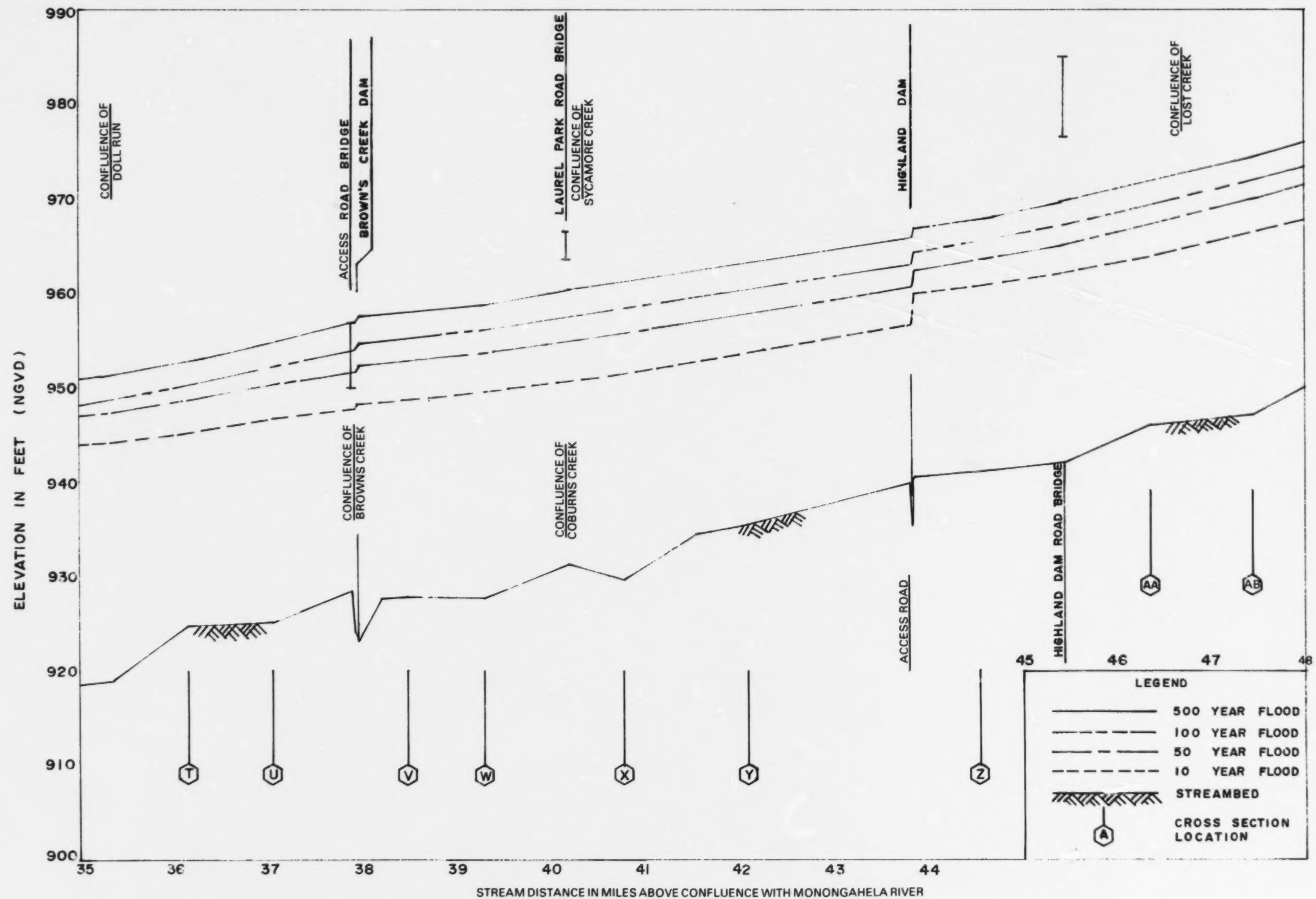
WEST FORK RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

HARRISON COUNTY, W. VA

(UNINCORPORATED AREAS)

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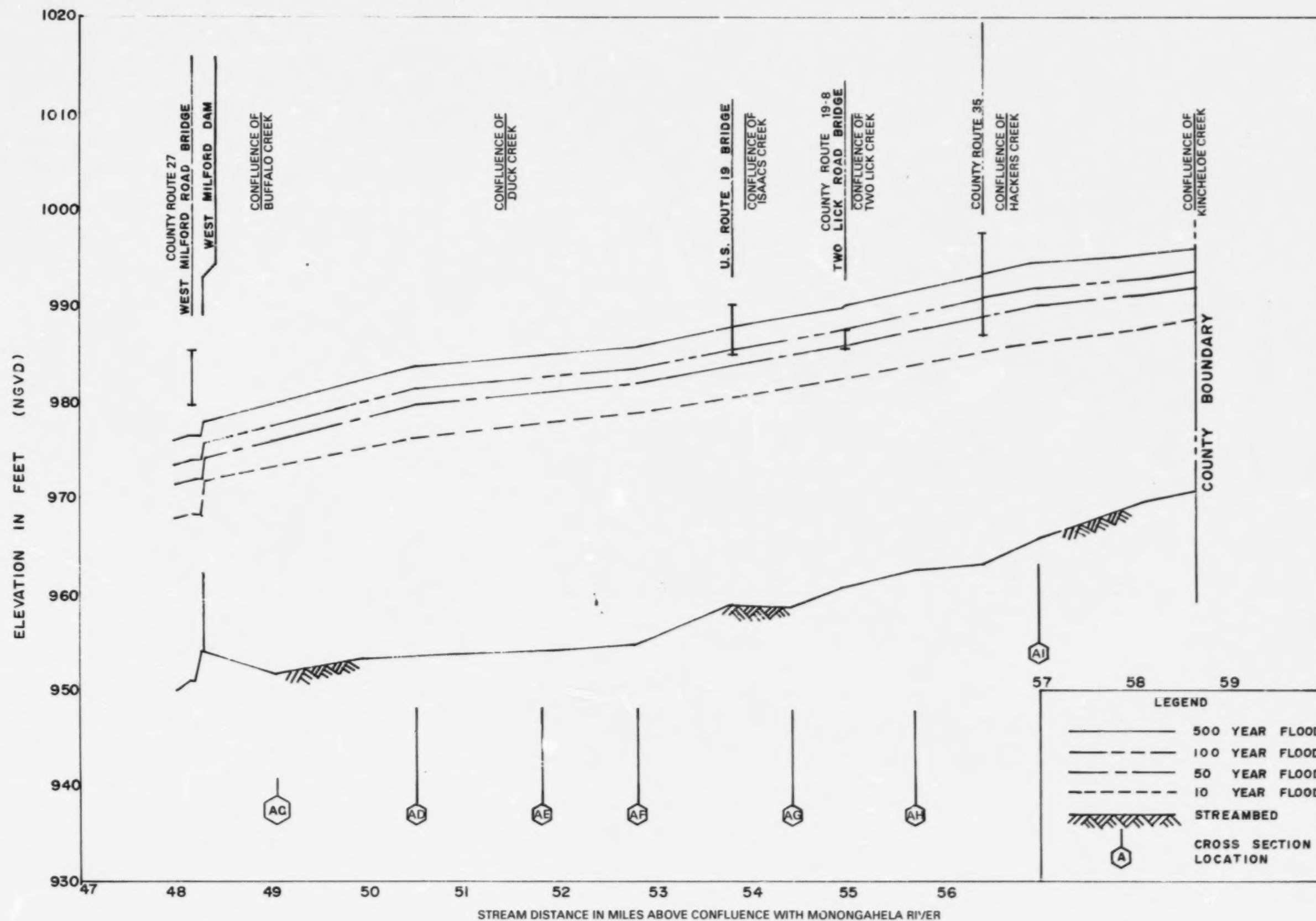


FLOOD PROFILES

WEST FORK RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY
HARRISON COUNTY, W. VA
(UNINCORPORATED AREAS)

03P



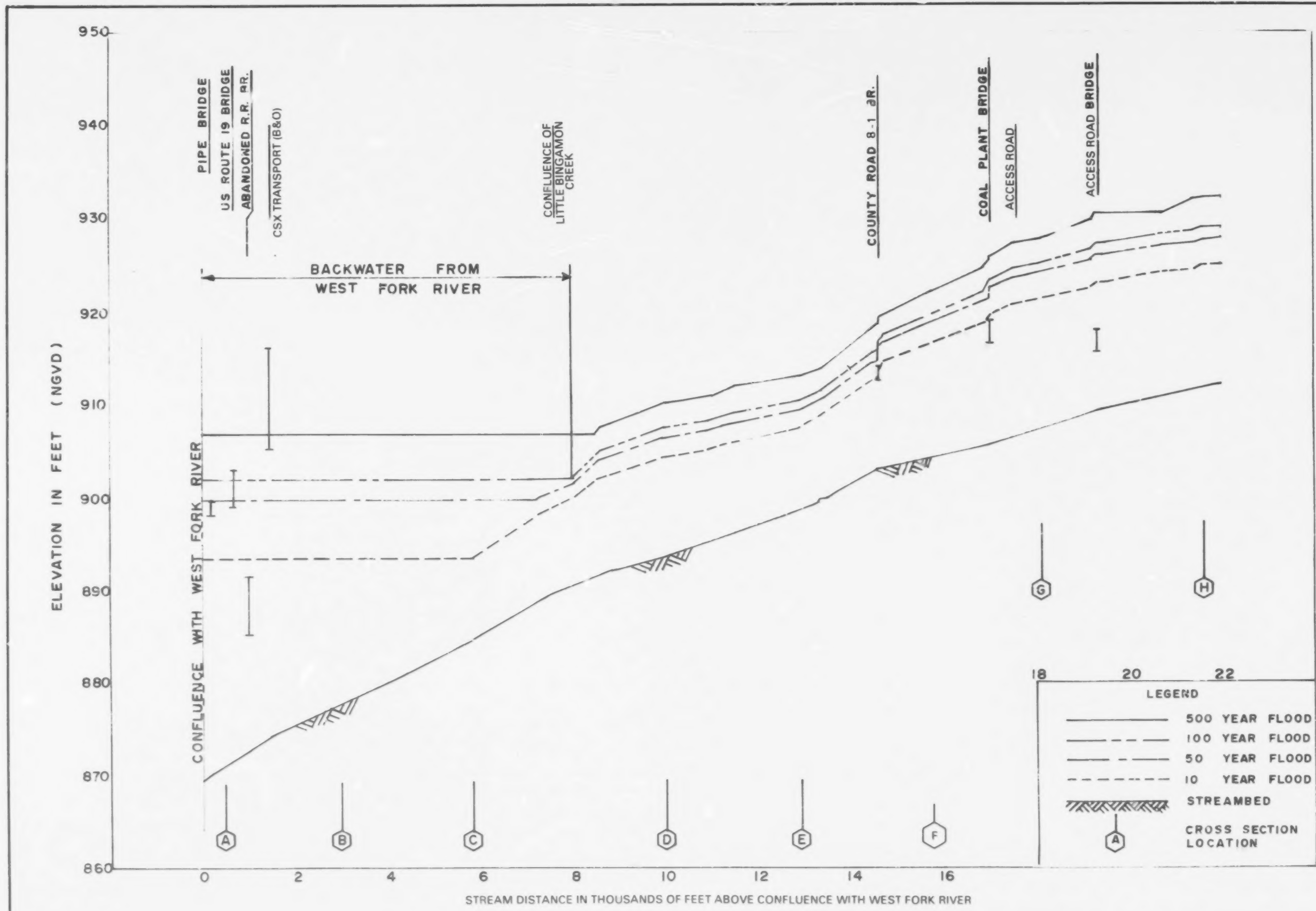
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HARRISON COUNTY, W. VA
(UNINCORPORATED AREAS)

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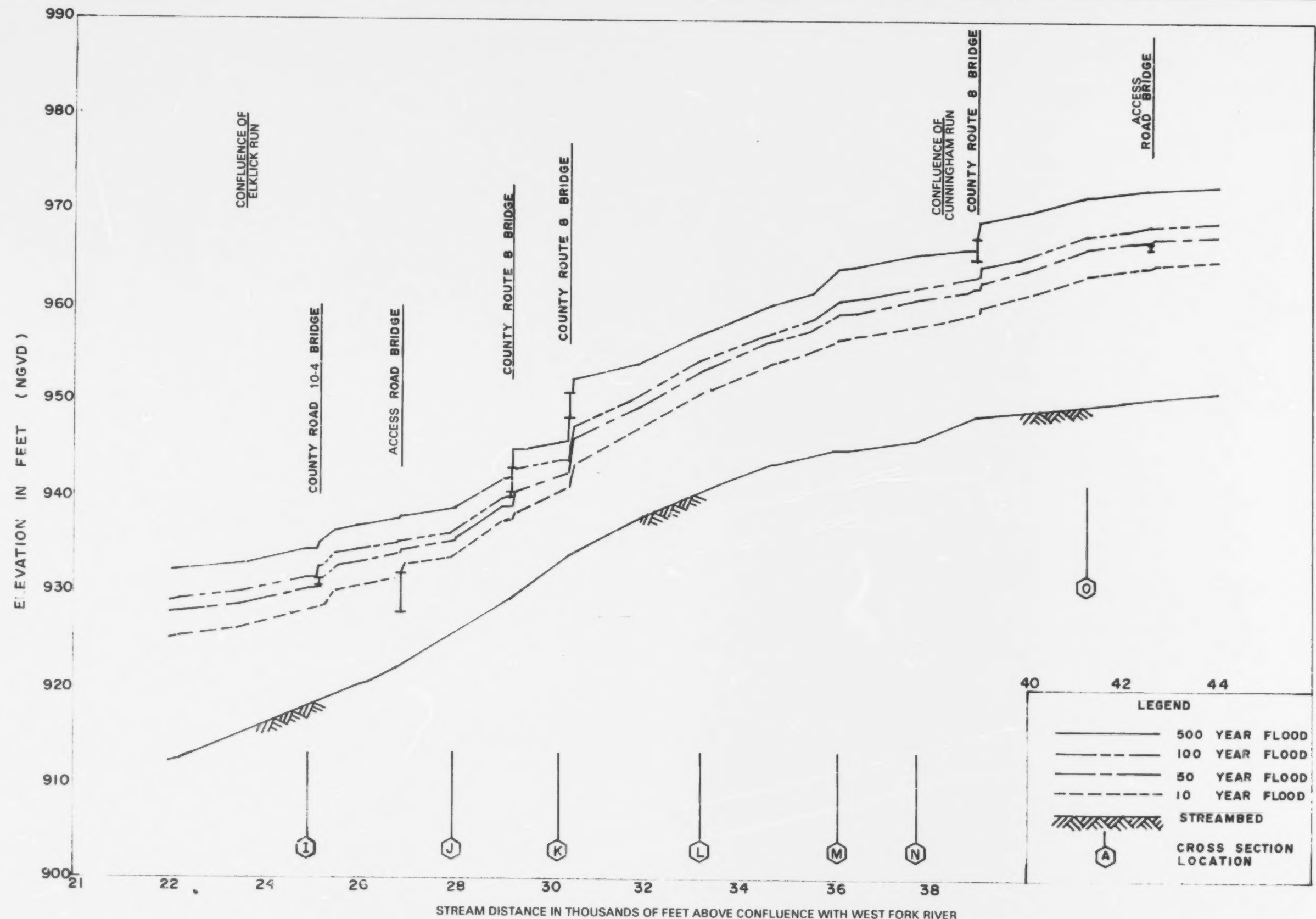
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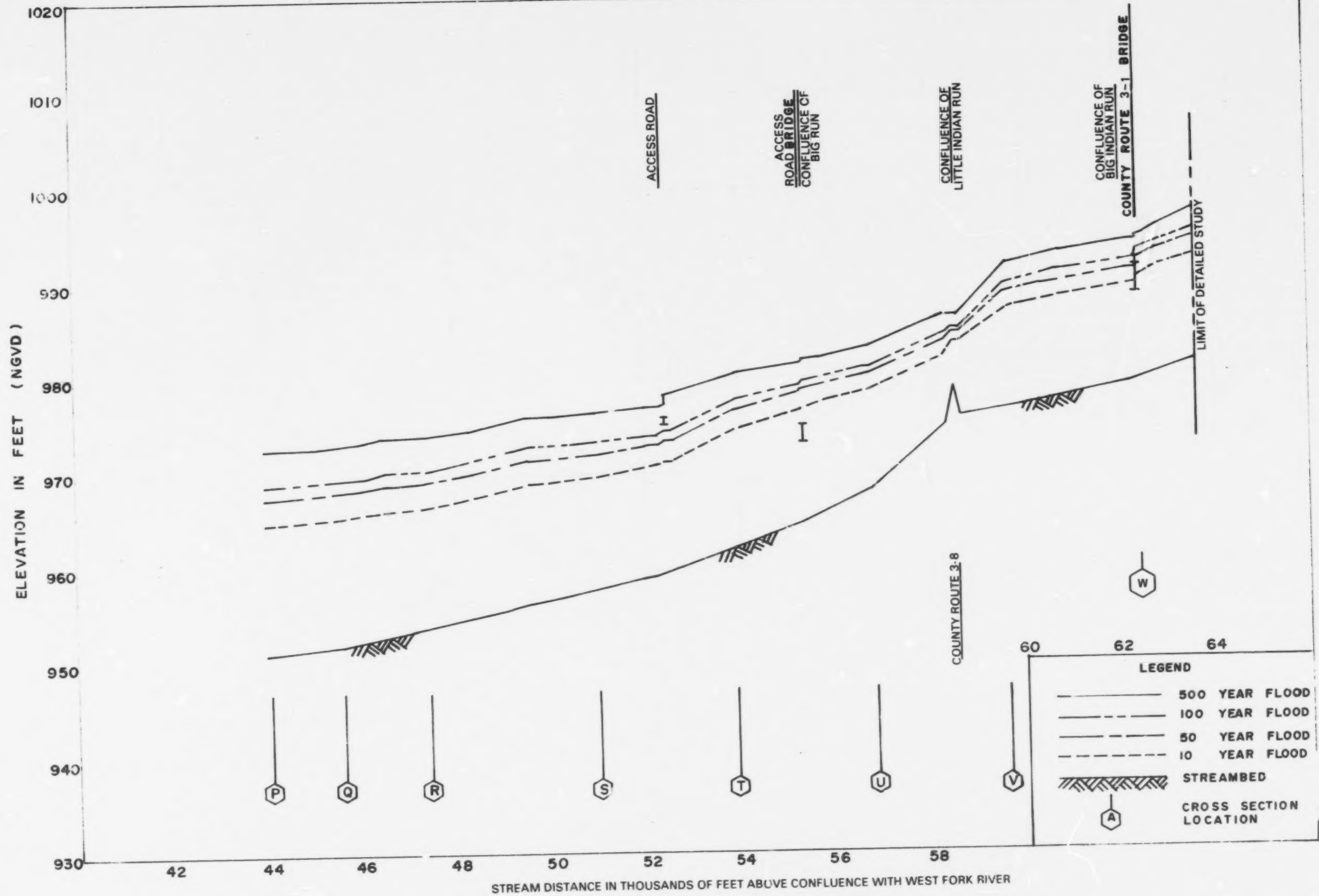
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	BINGAMON CREEK
05P	



FEDERAL EMERGENCY MANAGEMENT AGENCY
 HARRISON COUNTY, W. VA
 (UNINCORPORATED AREAS)

FLOOD PROFILES
BINGAMON CREEK

06P



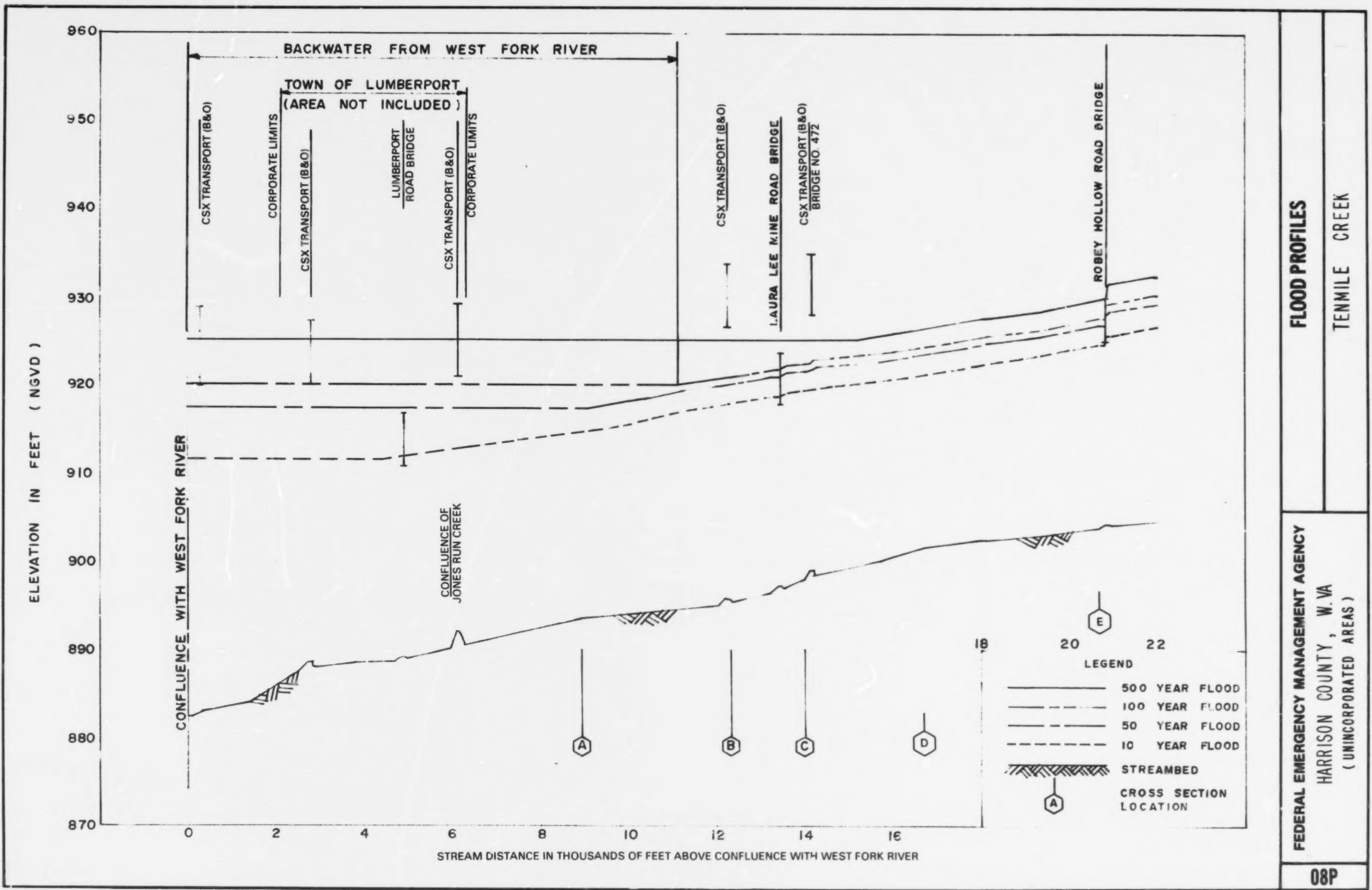
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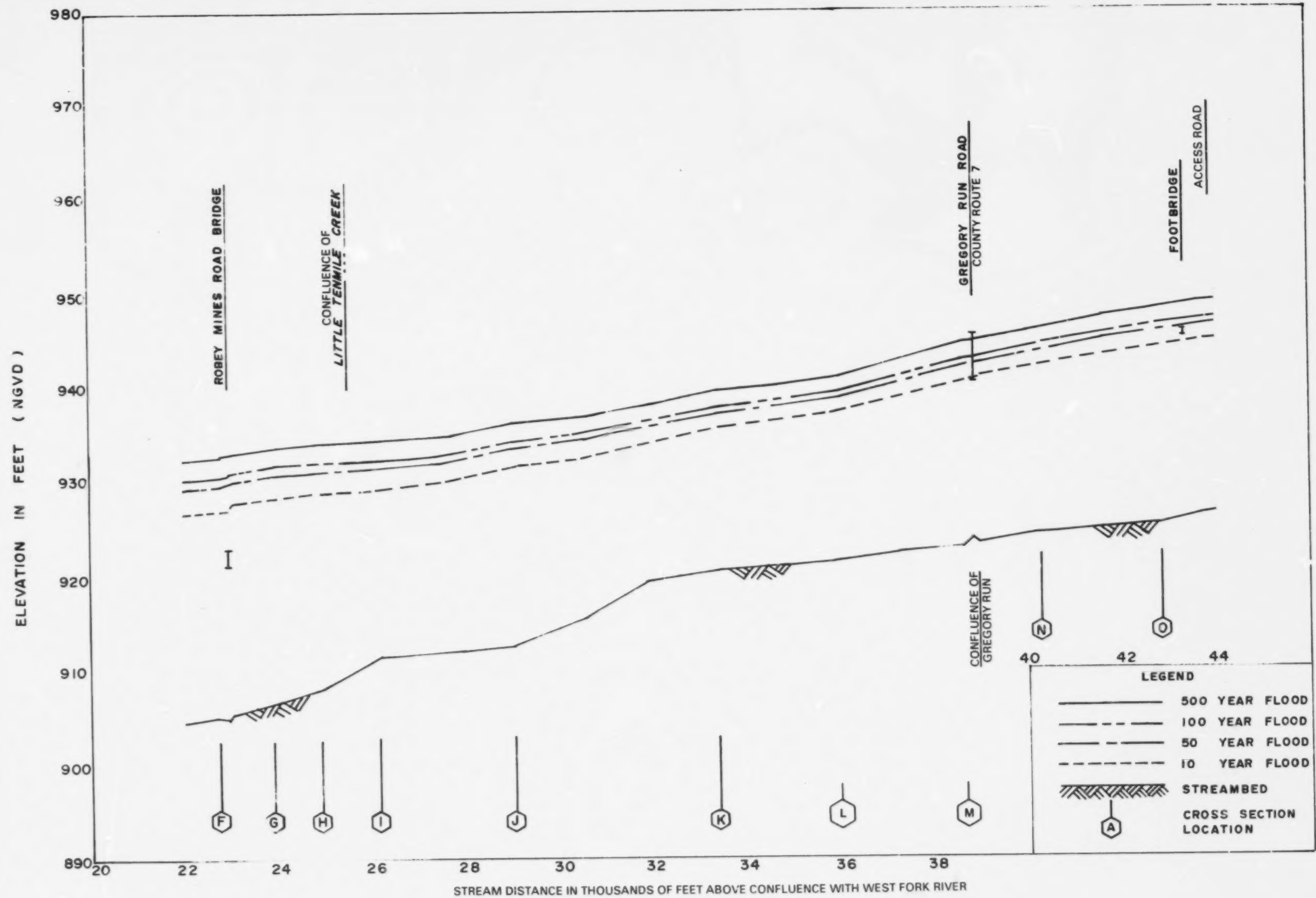
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HARRISON COUNTY, W. VA
(UNINCORPORATED AREAS)

07P





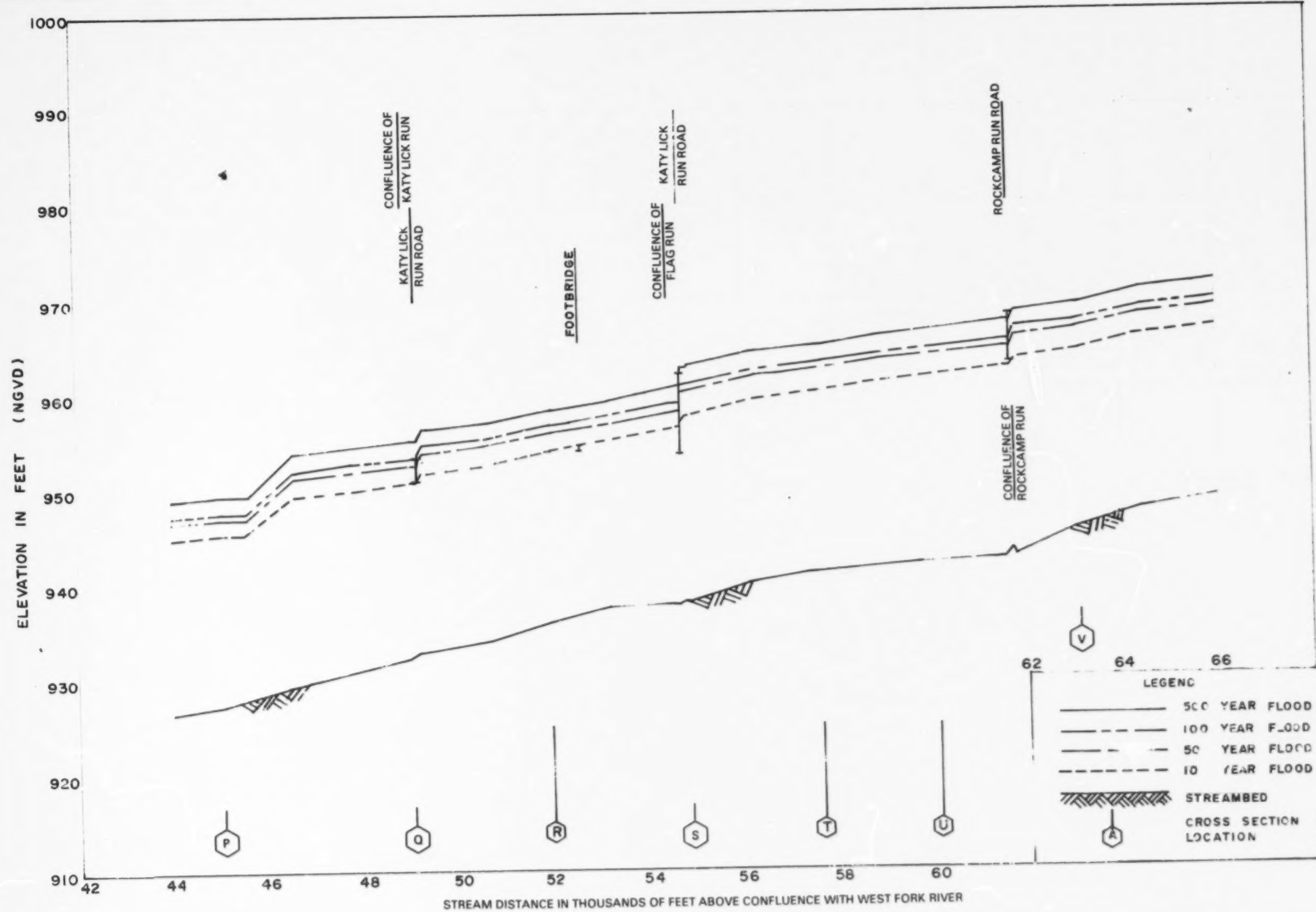
FLOOD PROFILES

TENMILE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

HARRISON COUNTY, W.VA
(UNINCORPORATED AREAS)

09P



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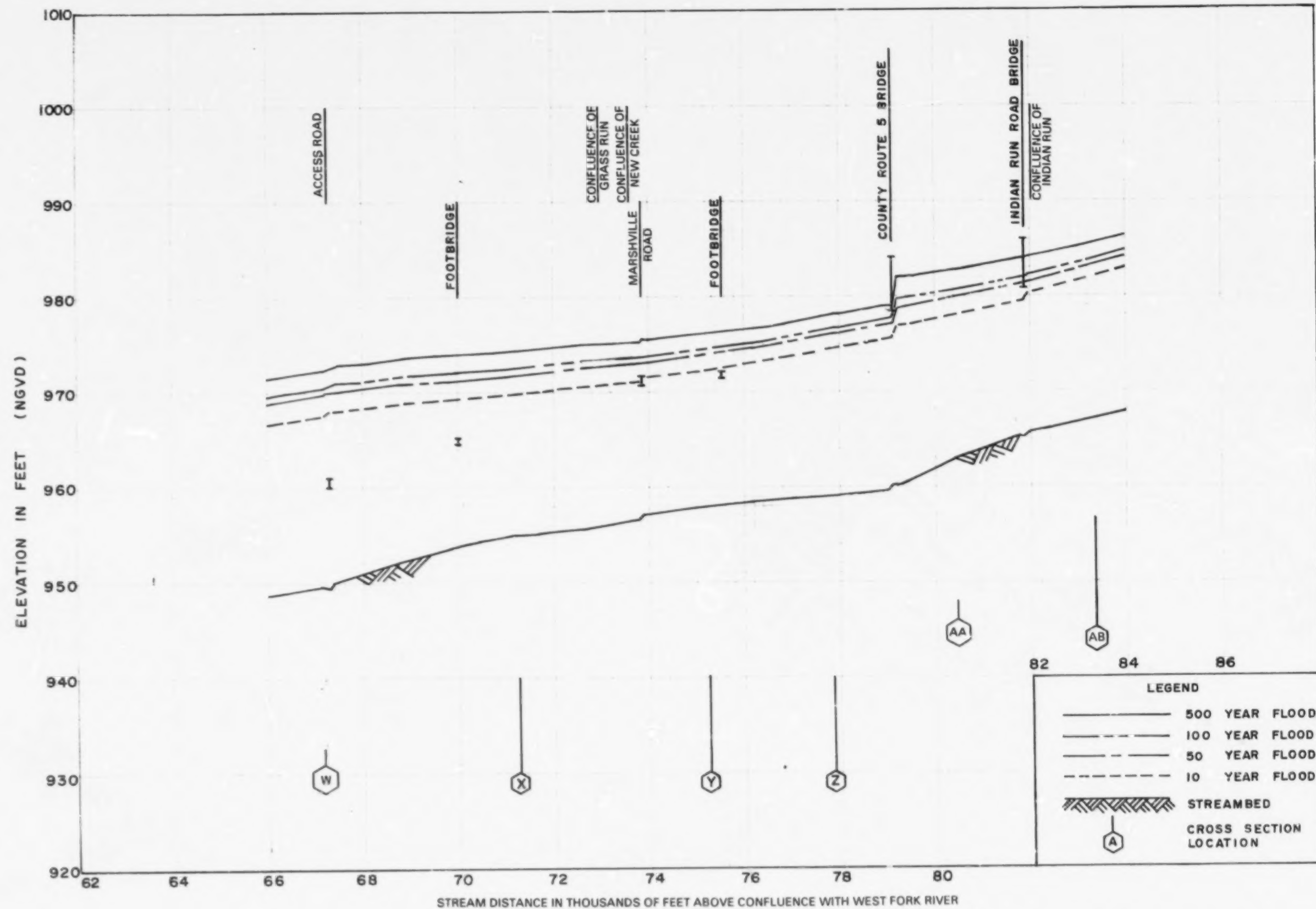
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HARRISON COUNTY, W. VA

(UNINCORPORATED AREAS)

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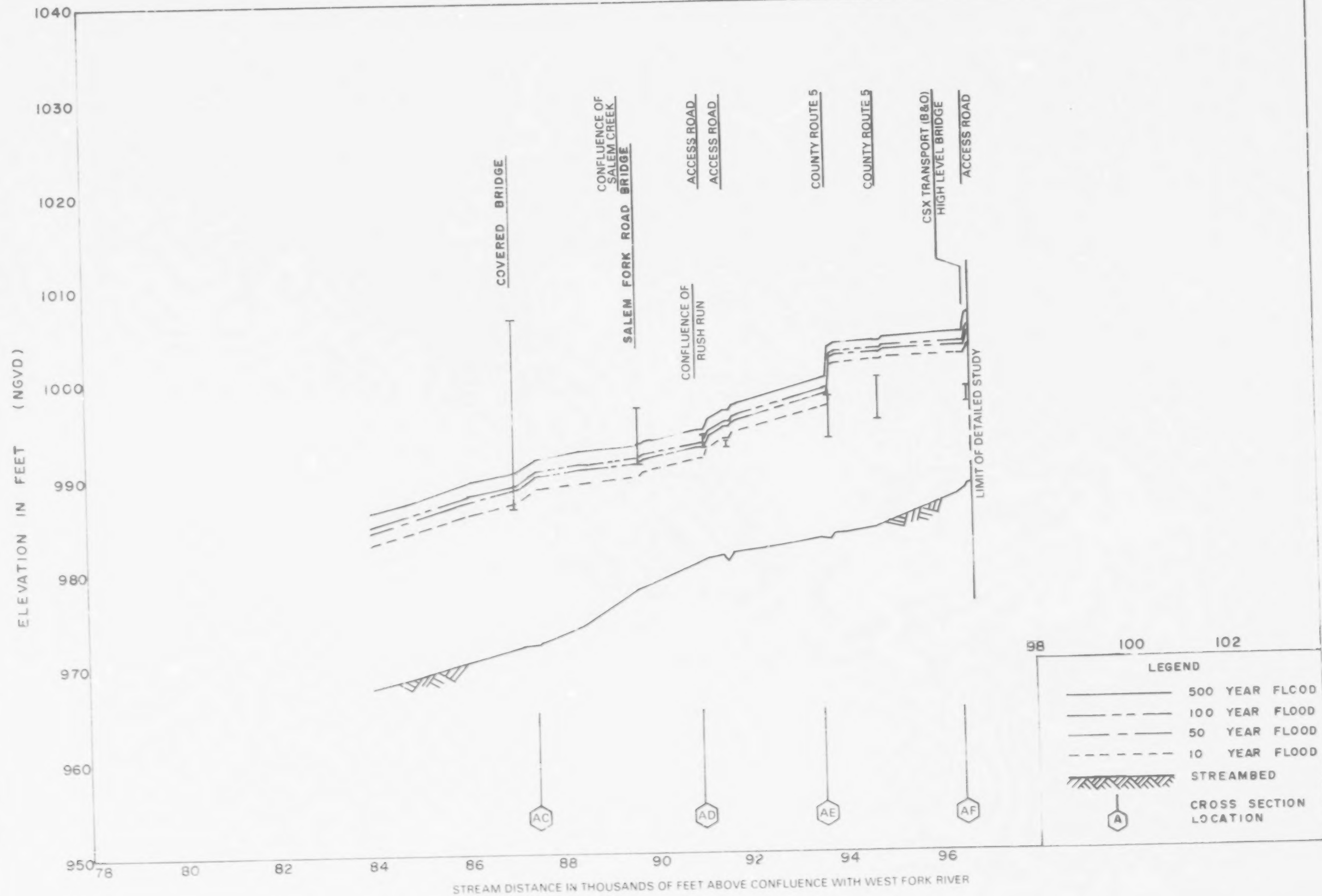


FLOOD PROFILES

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FEDERAL EMERGENCY MANAGEMENT AGENCY

HARRISON COUNTY, W.VA
(UNINCORPORATED AREAS)



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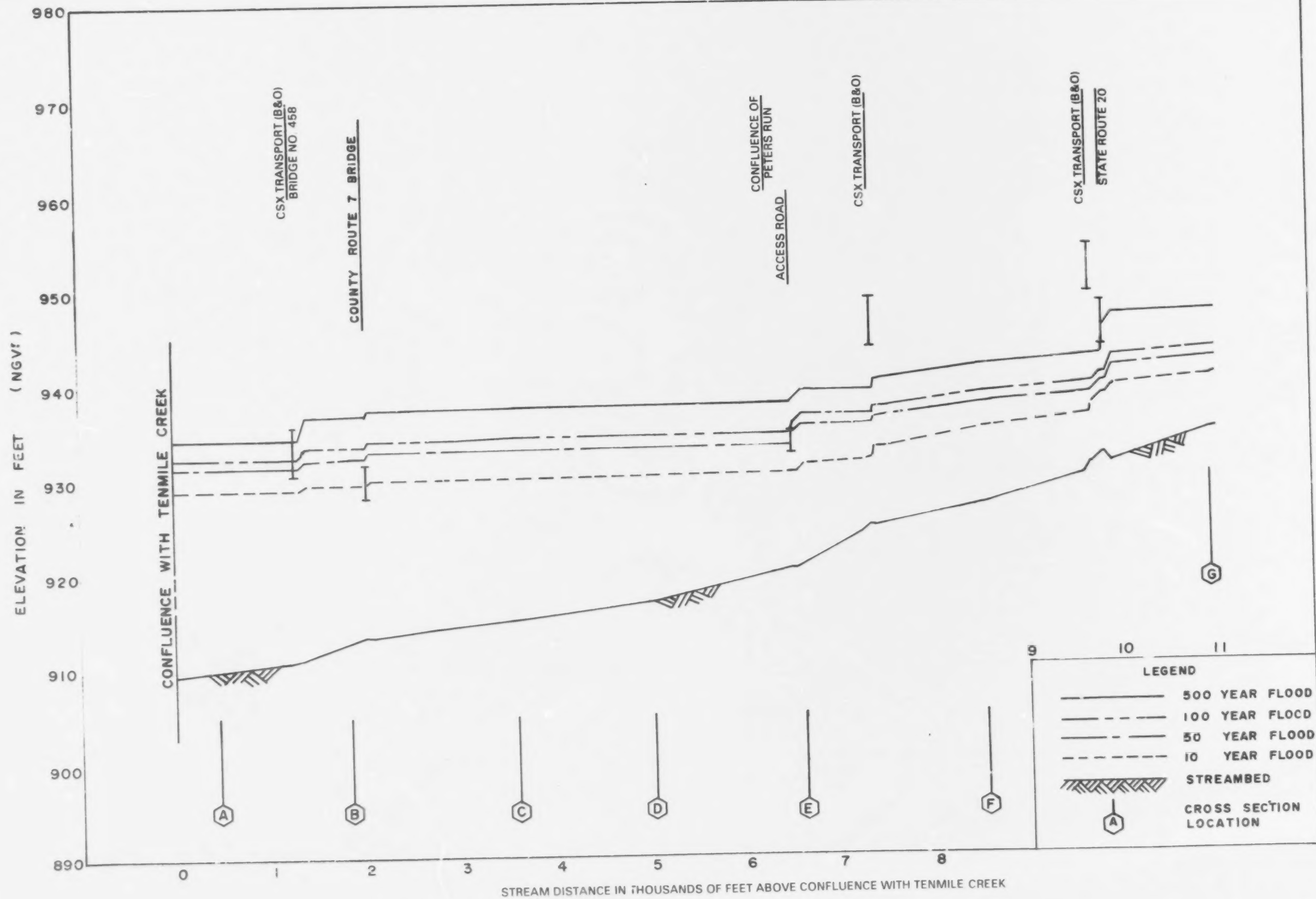
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FEDERAL EMERGENCY MANAGEMENT AGENCY

HARRISON COUNTY, W. VA

(UNINCORPORATED AREAS)

12P



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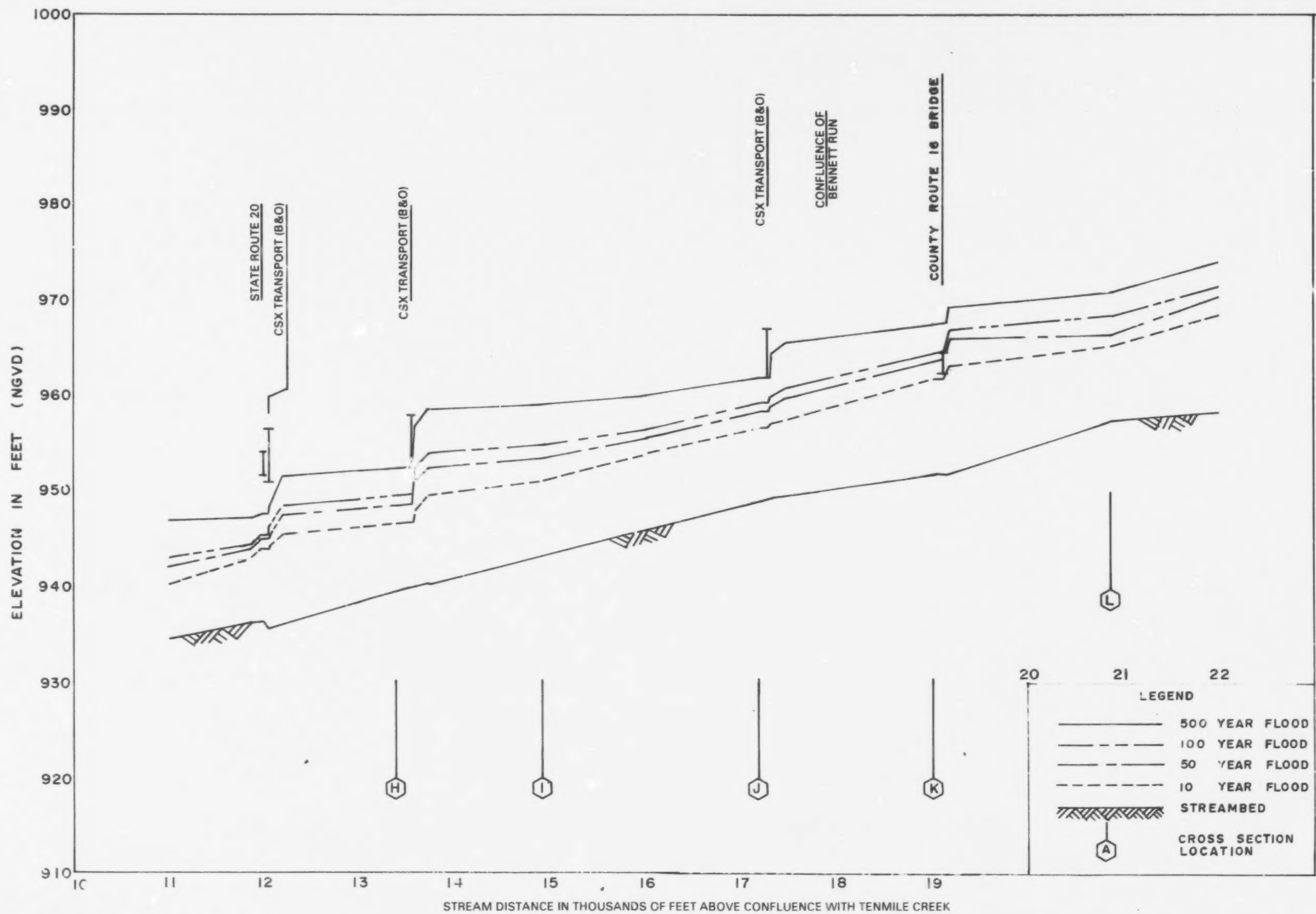
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FEDERAL EMERGENCY MANAGEMENT AGENCY

HARRISON COUNTY, W. VA

(UNINCORPORATED AREAS)

13P



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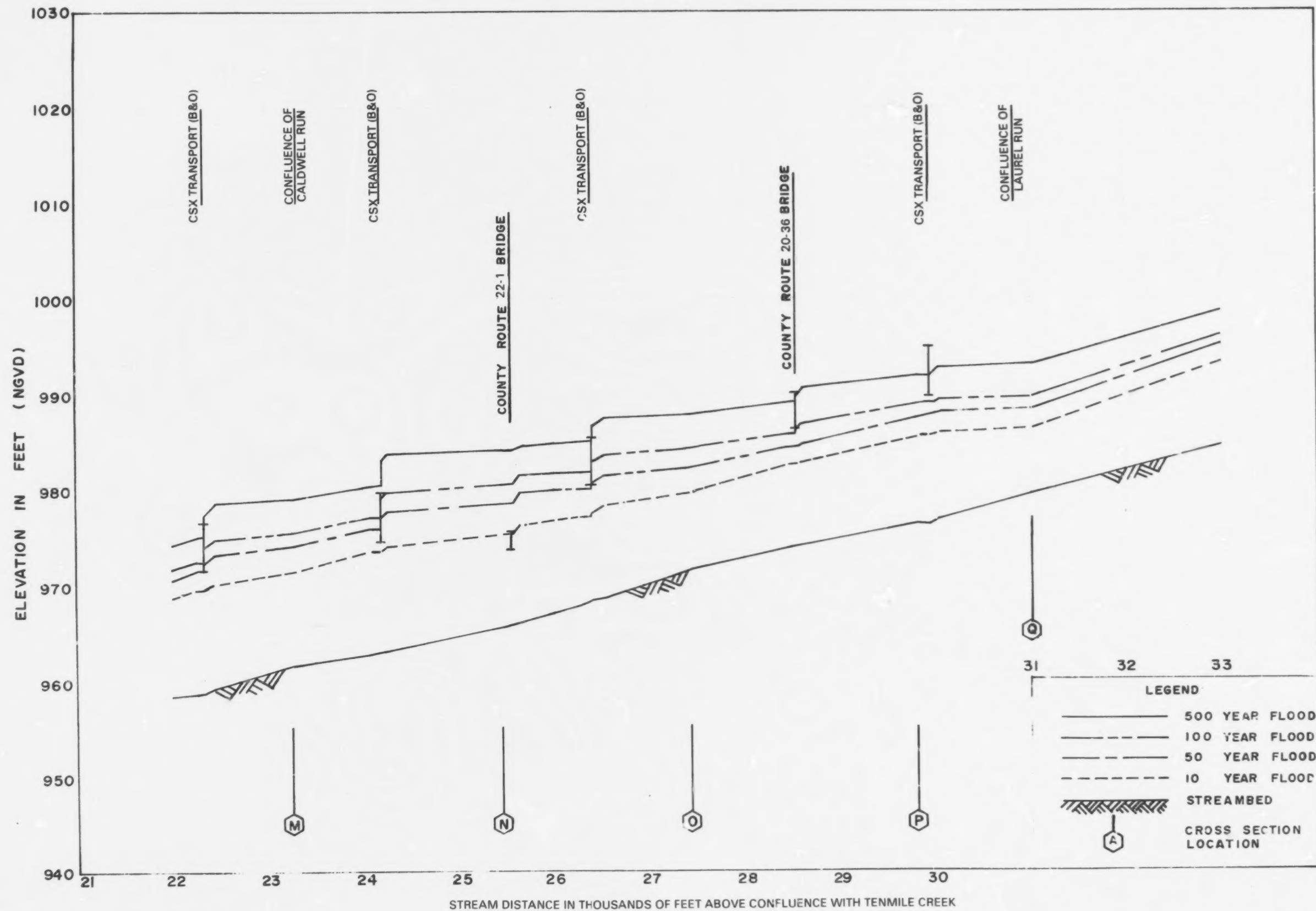
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FEDERAL EMERGENCY MANAGEMENT AGENCY

HARRISON COUNTY, W. VA

(UNINCORPORATED AREAS)

14P

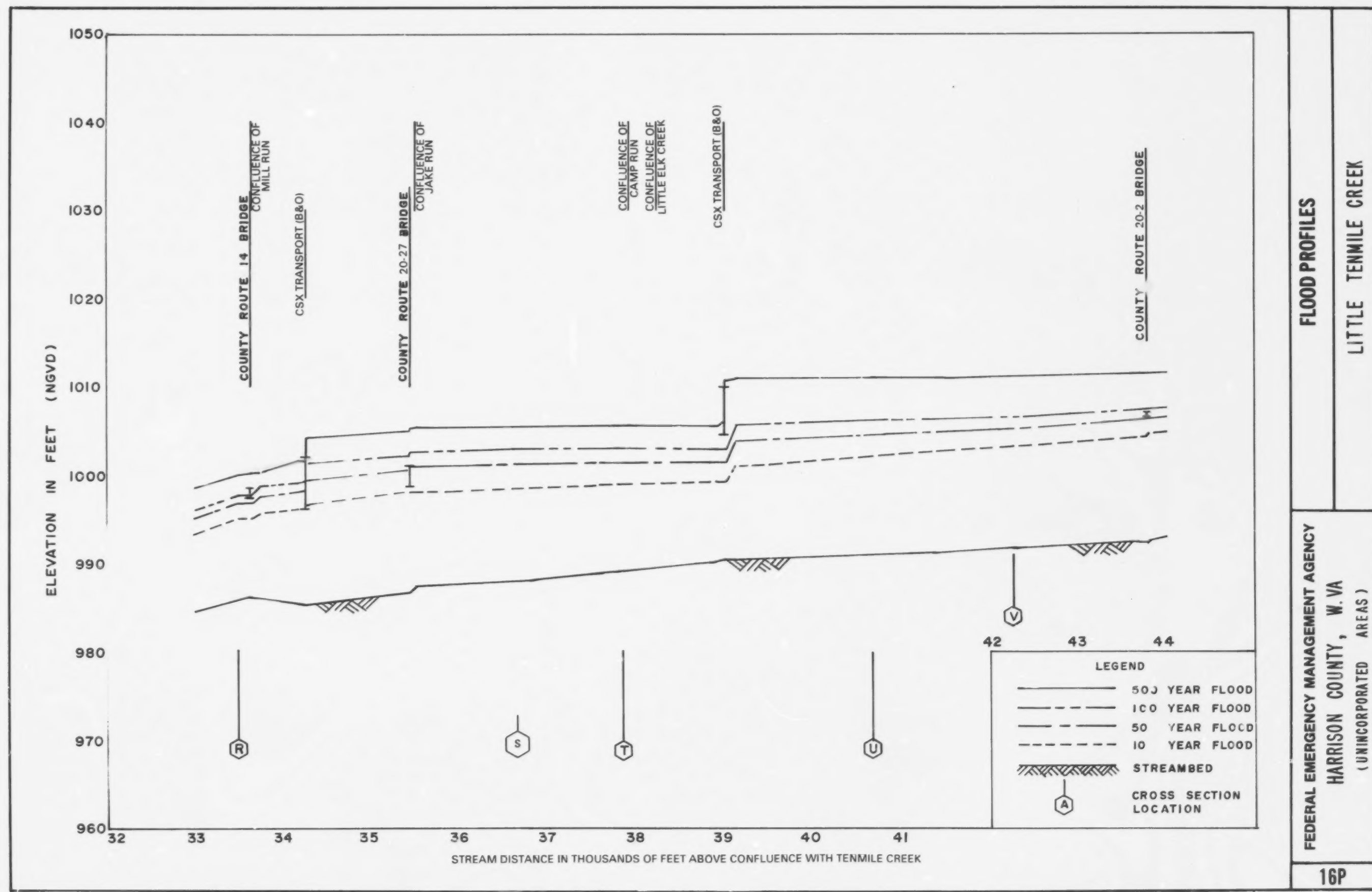


FLOOD PROFILES

LITTLE TENMILE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY
HARRISON COUNTY, W. VA
(UNINCORPORATED AREAS)

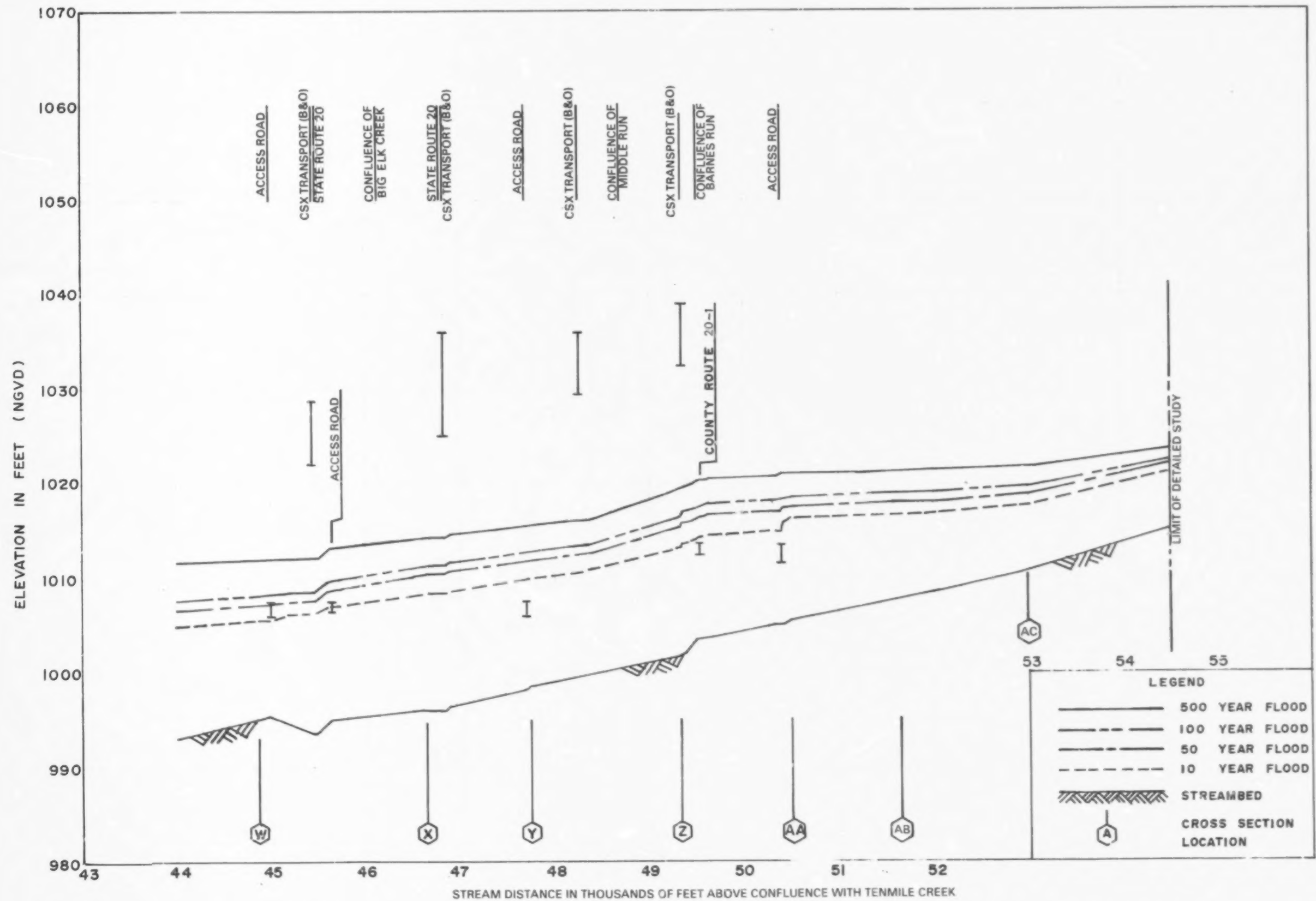
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LITTLE TENMILE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY
HARRISON COUNTY, W. VA
(UNINCORPORATED AREAS)



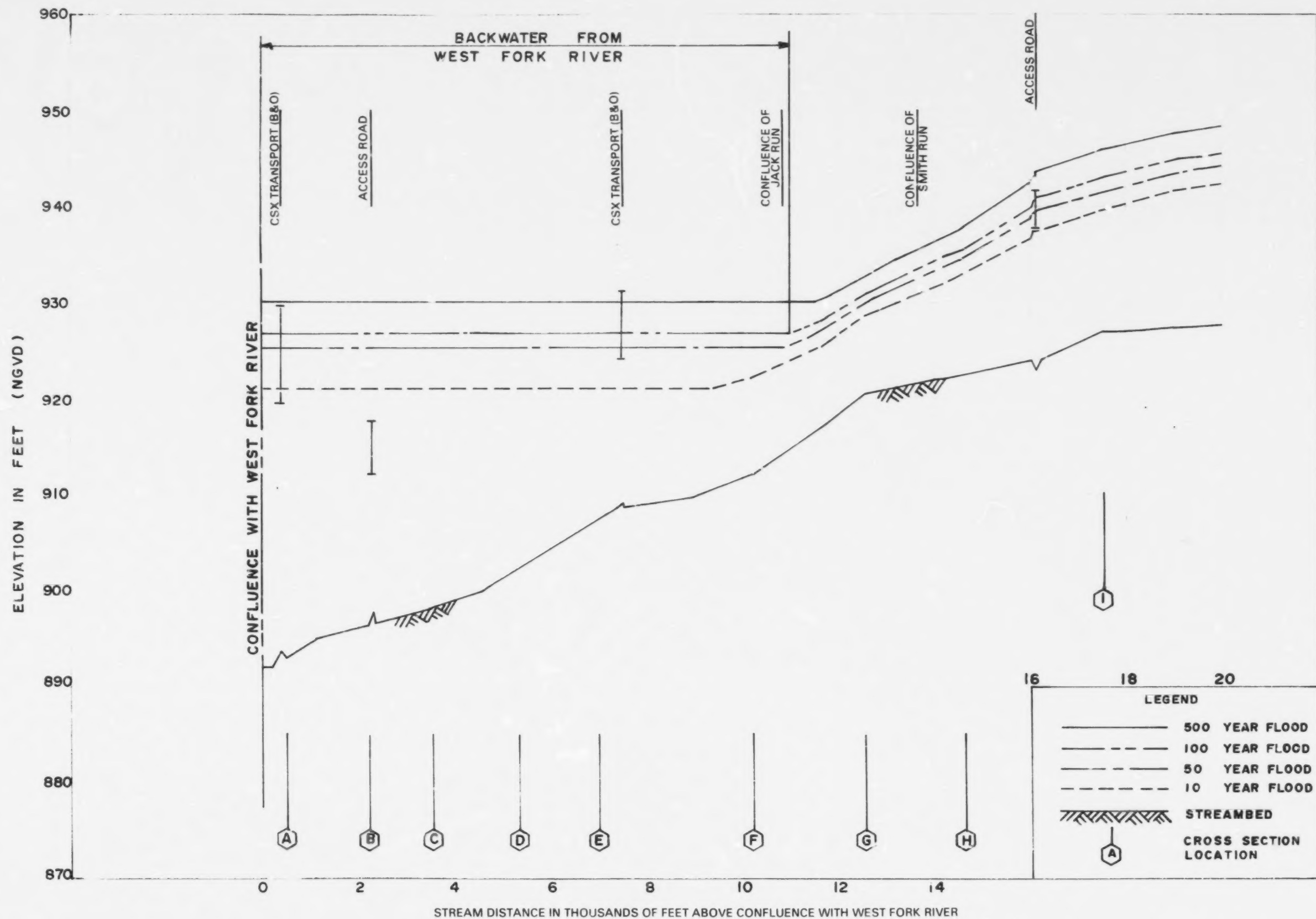
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LITTLE TENMILE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY
HARRISON COUNTY, W.VA
(UNINCORPORATED AREAS)

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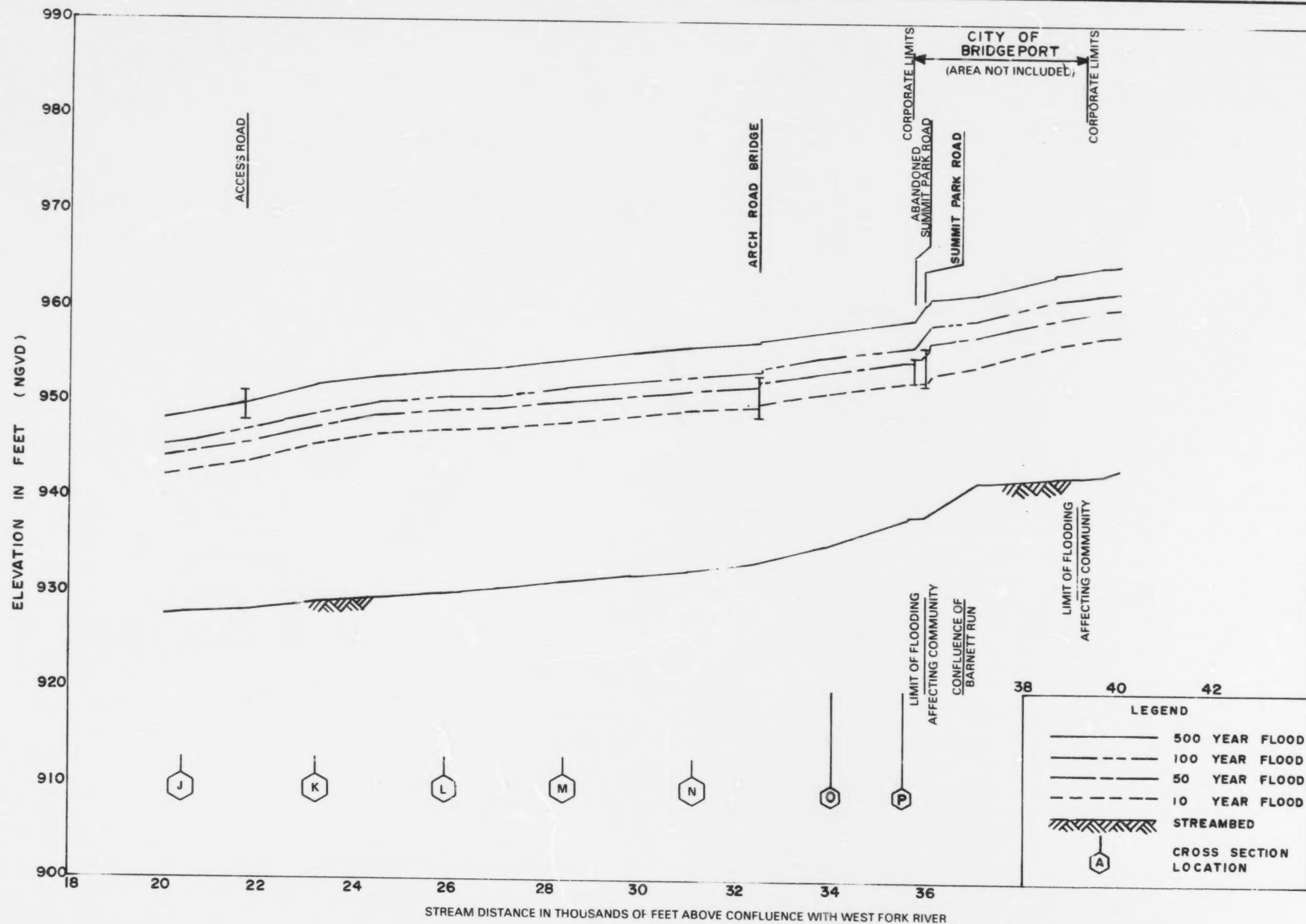
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SIMPSON CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

HARRISON COUNTY, W. VA
(UNINCORPORATED AREAS)

18P



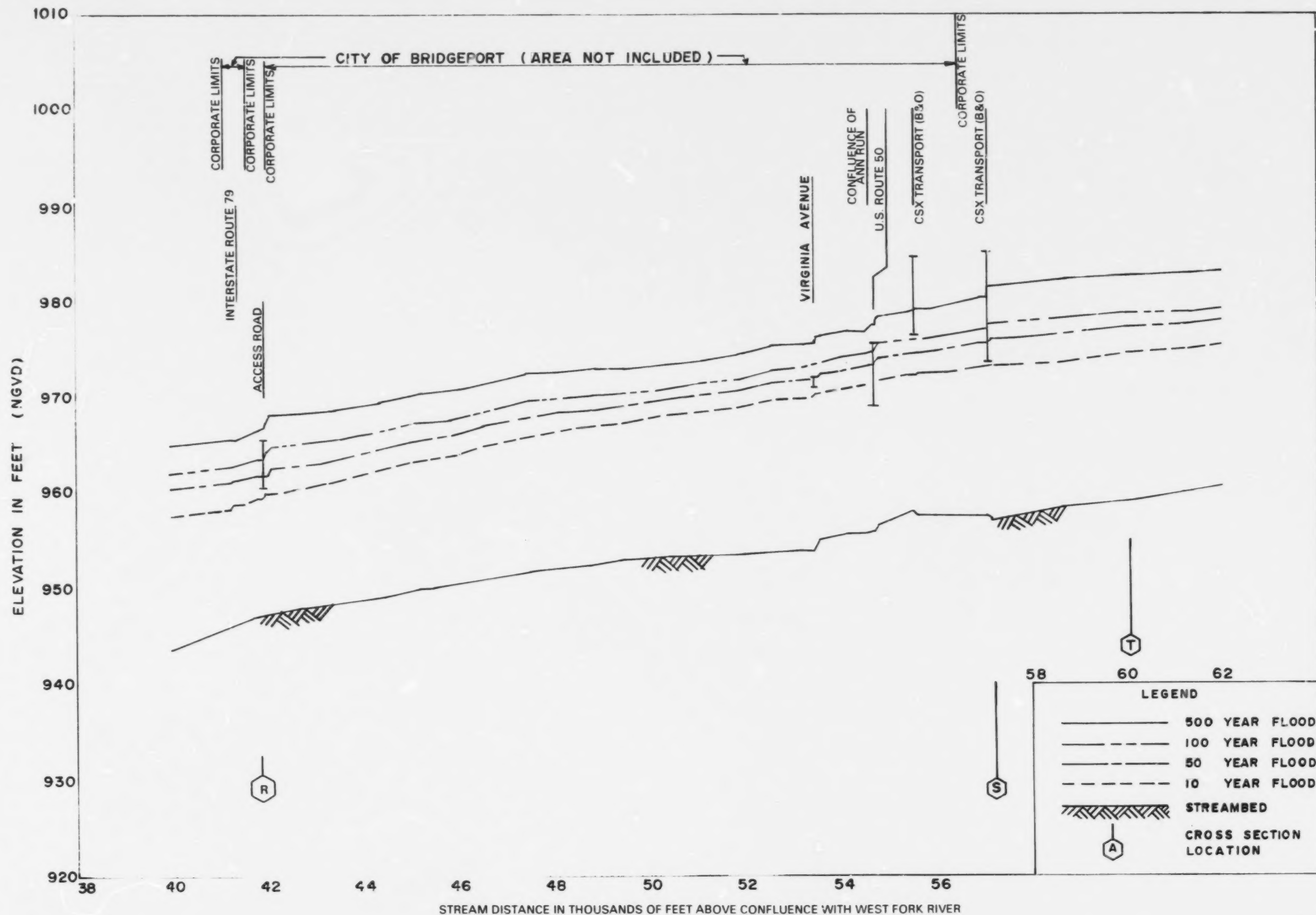
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HARRISON COUNTY, W. VA
(UNINCORPORATED AREAS)

FLOOD PROFILES

SIMPSON CREEK

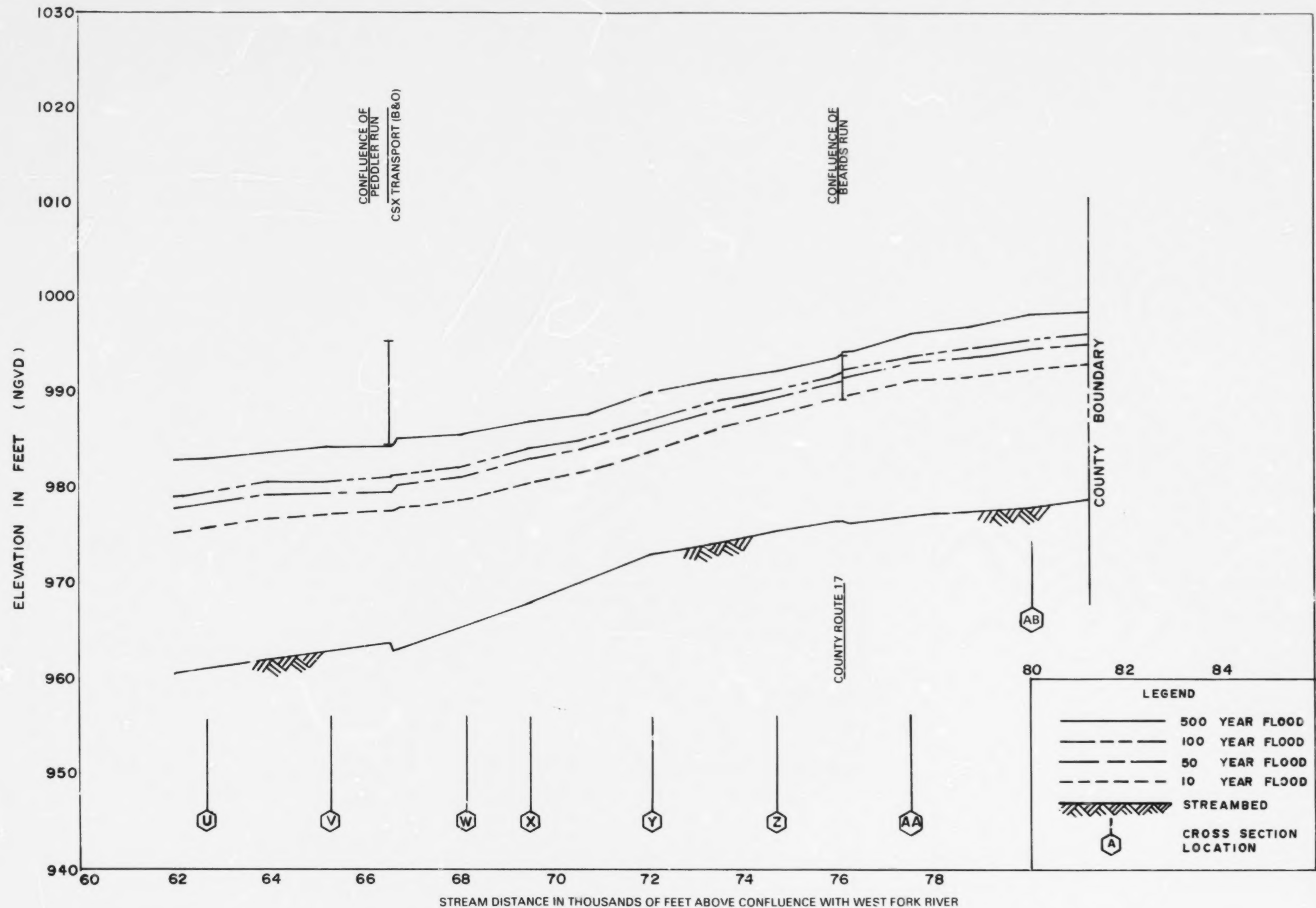
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SIMPSON CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY
HARRISON COUNTY, W. VA
(UNINCORPORATED AREAS)



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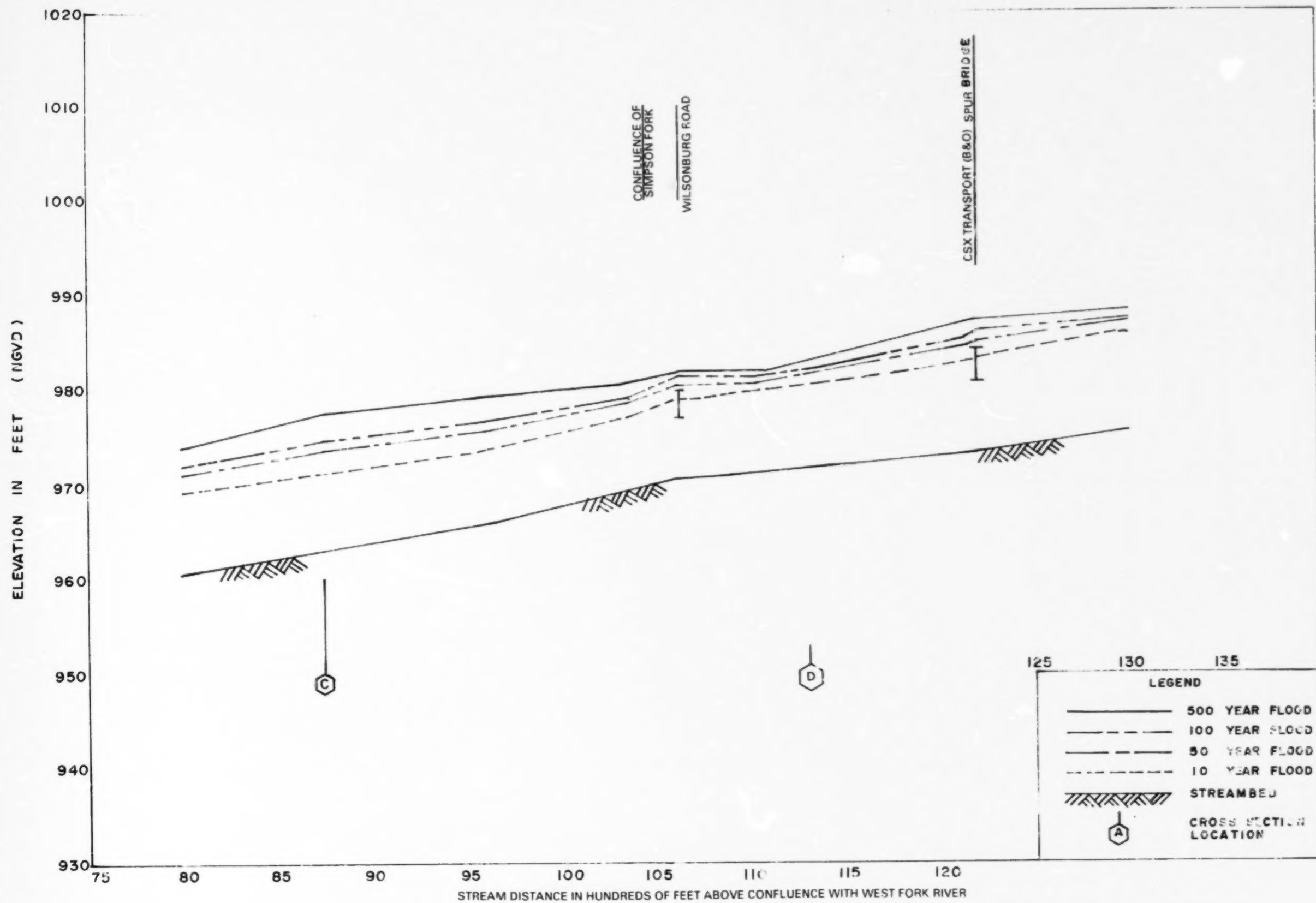
SIMPSON CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

HARRISON COUNTY, W. VA

(UNINCORPORATED AREAS)

21P



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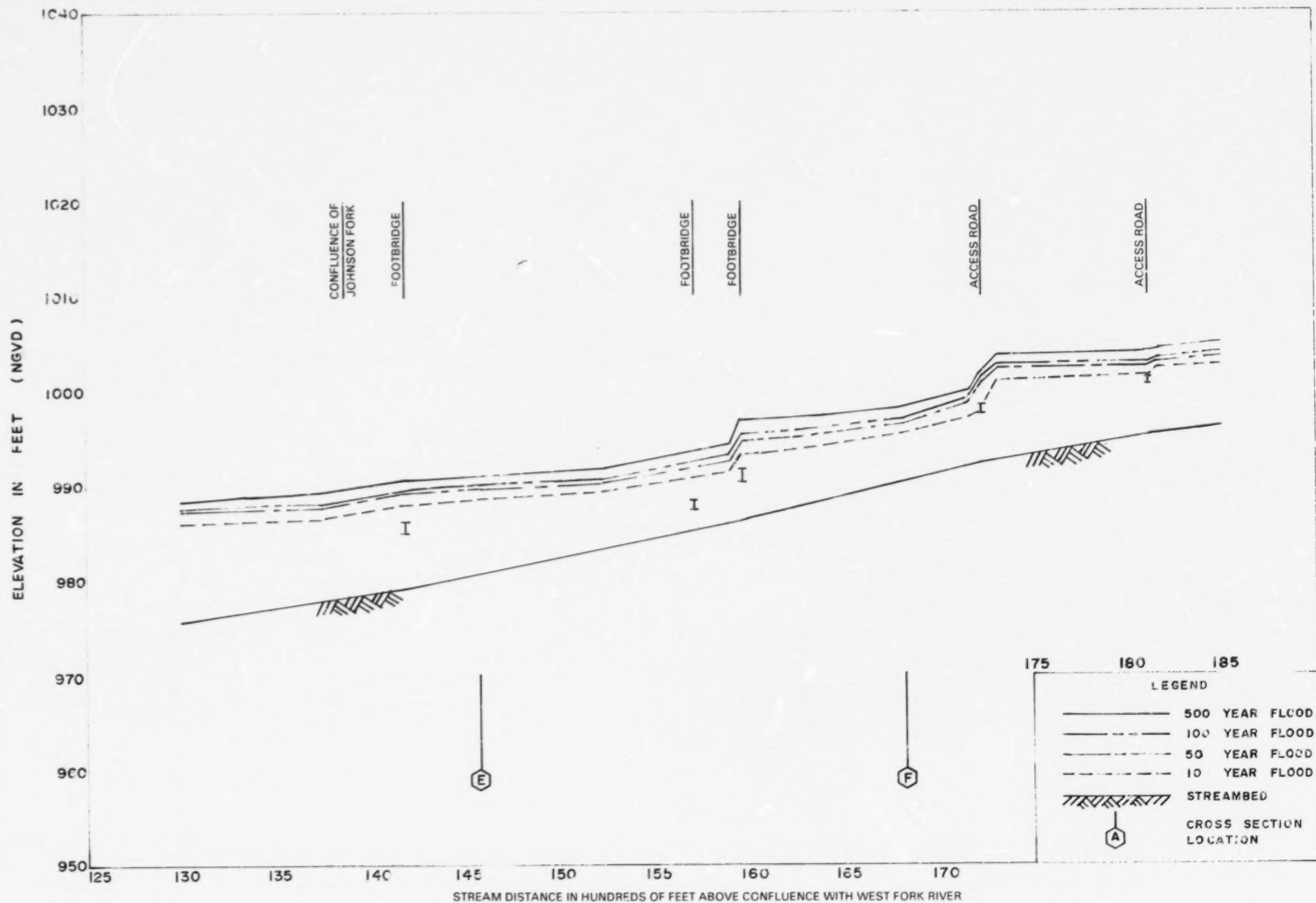
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FEDERAL EMERGENCY MANAGEMENT AGENCY

HARRISON COUNTY, W. VA

(UNINCORPORATED AREAS)

23P



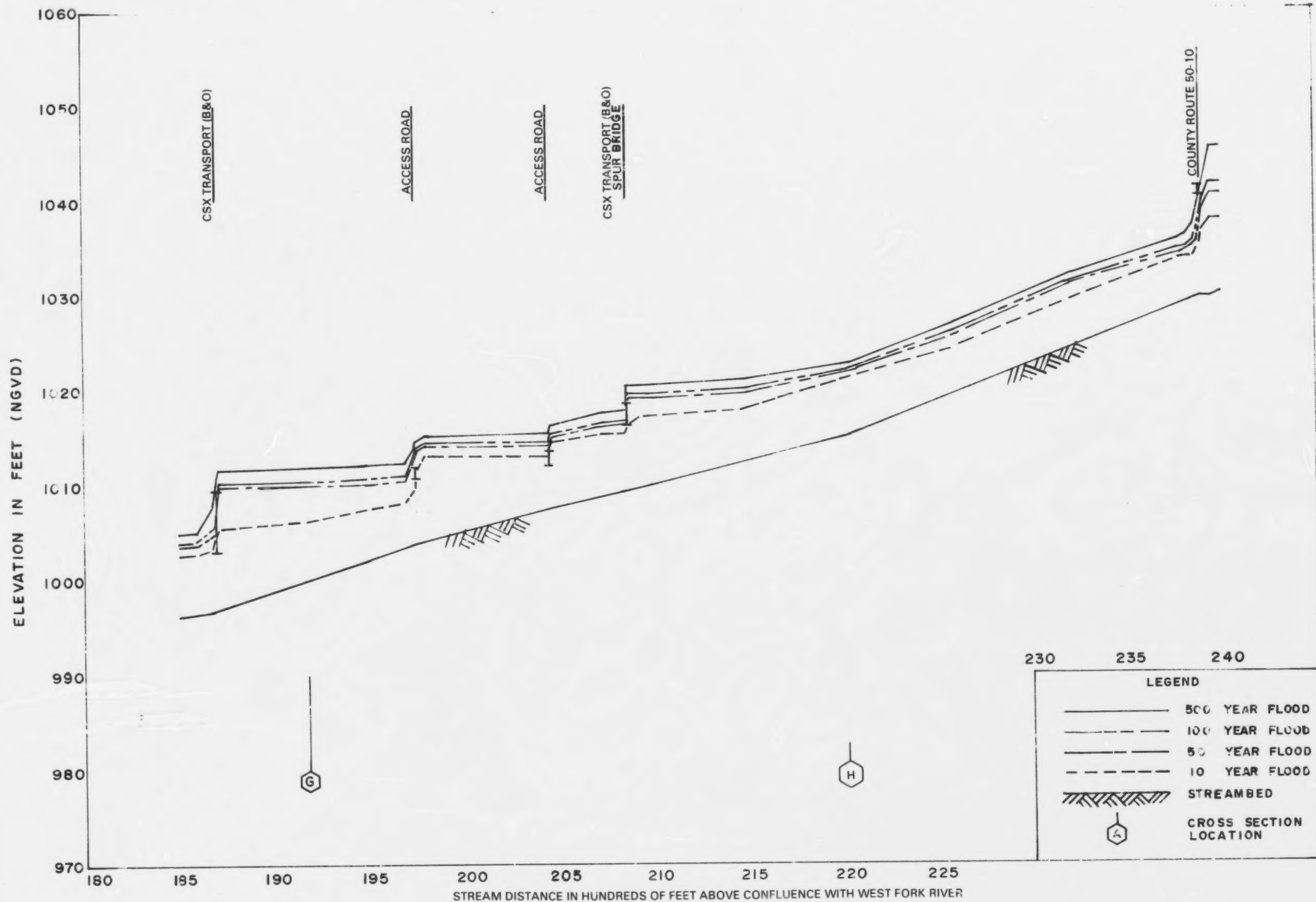
FLOOD PROFILES

LIMESTONE RUN

FEDERAL EMERGENCY MANAGEMENT AGENCY

HARRISON COUNTY, W. VA

(UNINCORPORATED AREAS)



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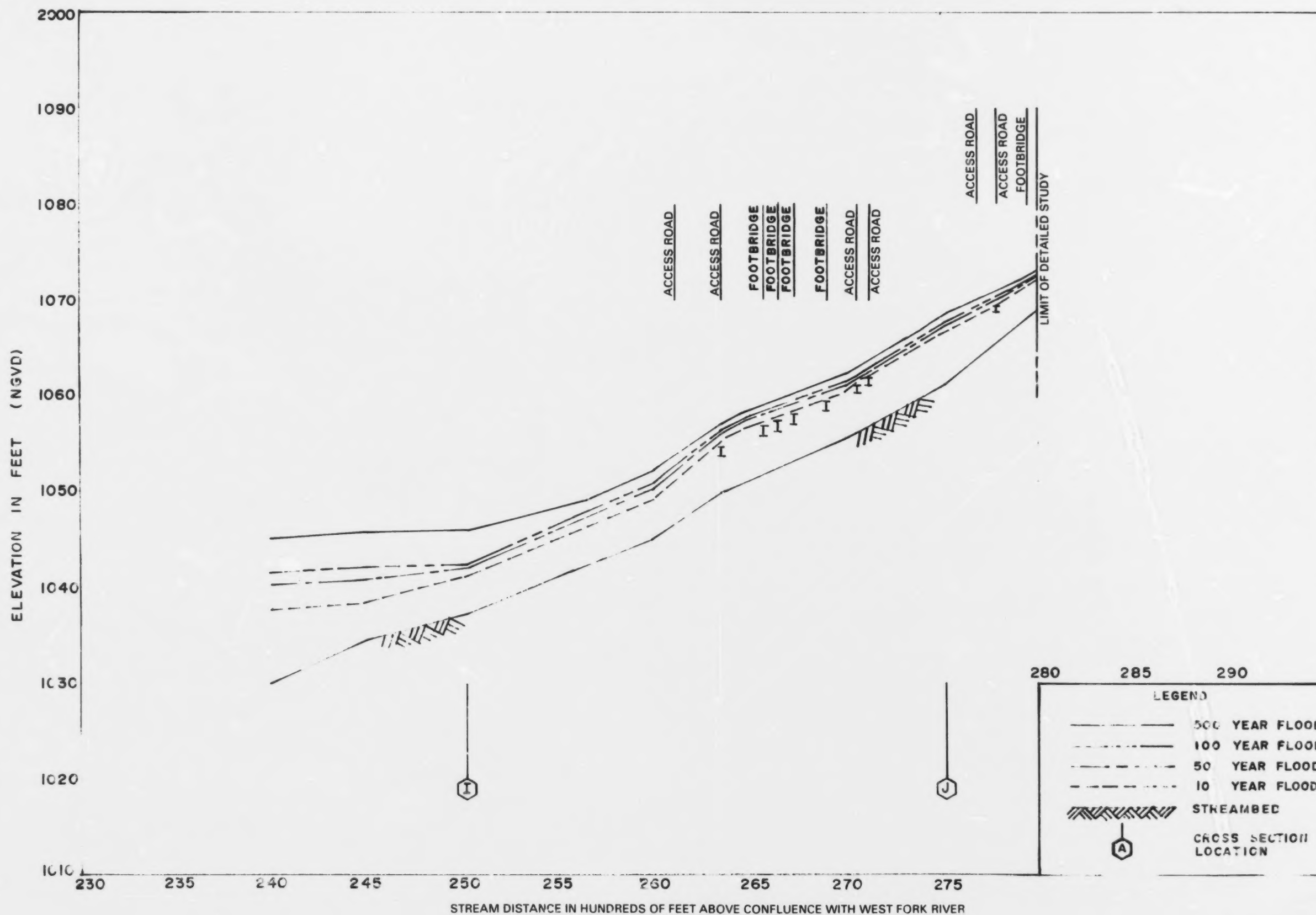
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FEDERAL EMERGENCY MANAGEMENT AGENCY

HARRISON COUNTY, W. VA

(UNINCORPORATED AREAS)

25P



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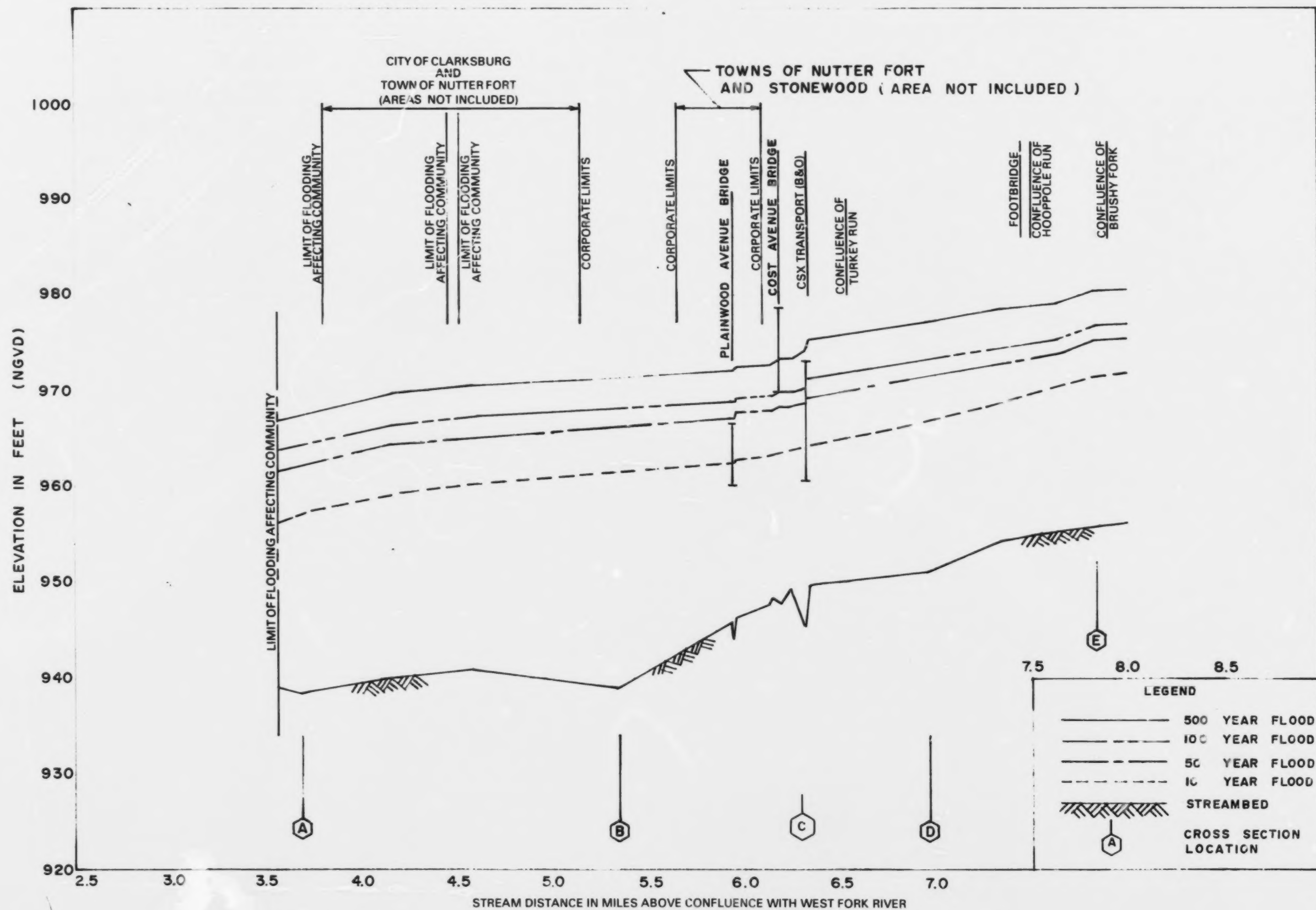
LIMESTONE RUN

FEDERAL EMERGENCY MANAGEMENT AGENCY

HARRISON COUNTY, W. VA

(UNINCORPORATED AREAS)

26P

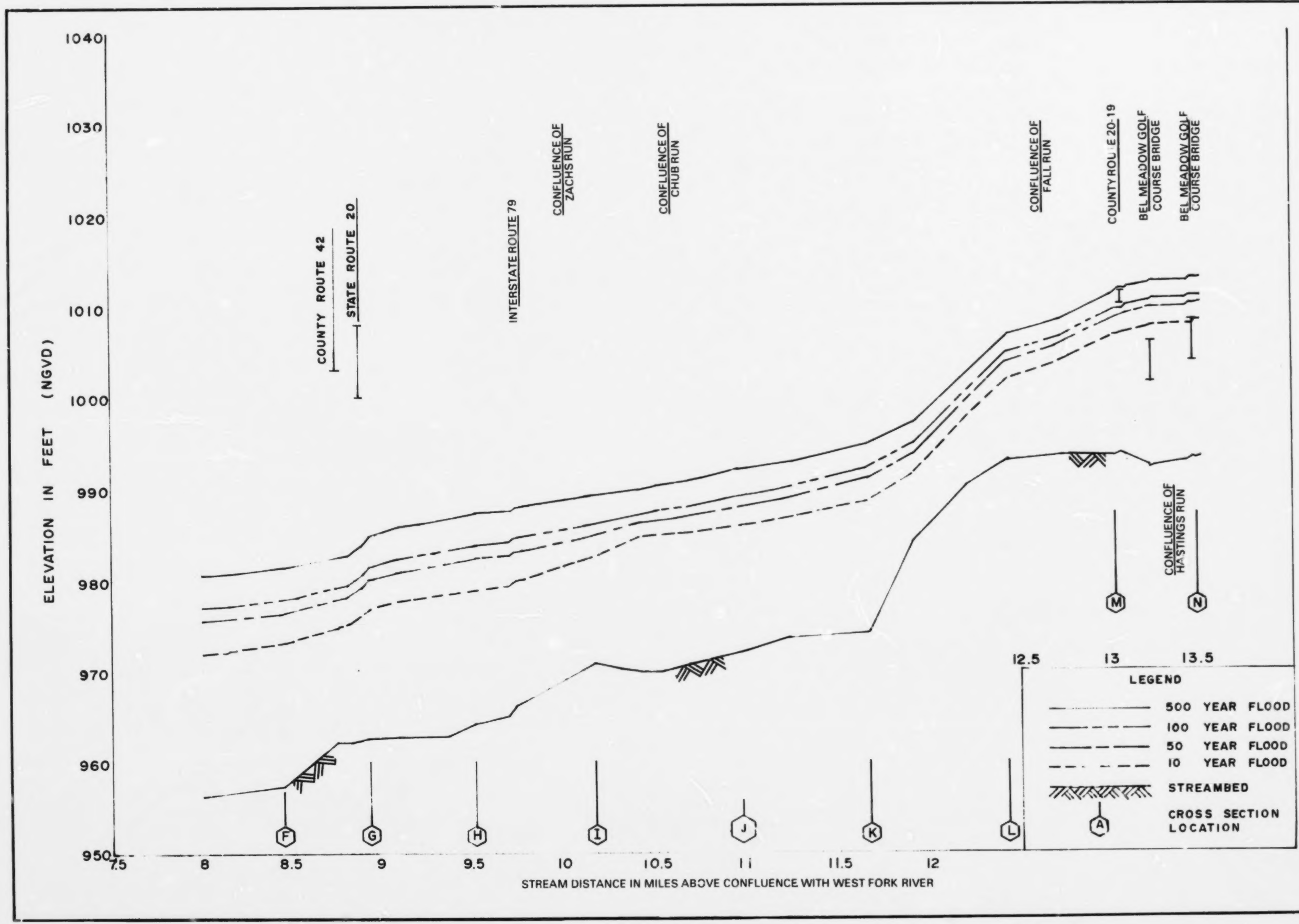


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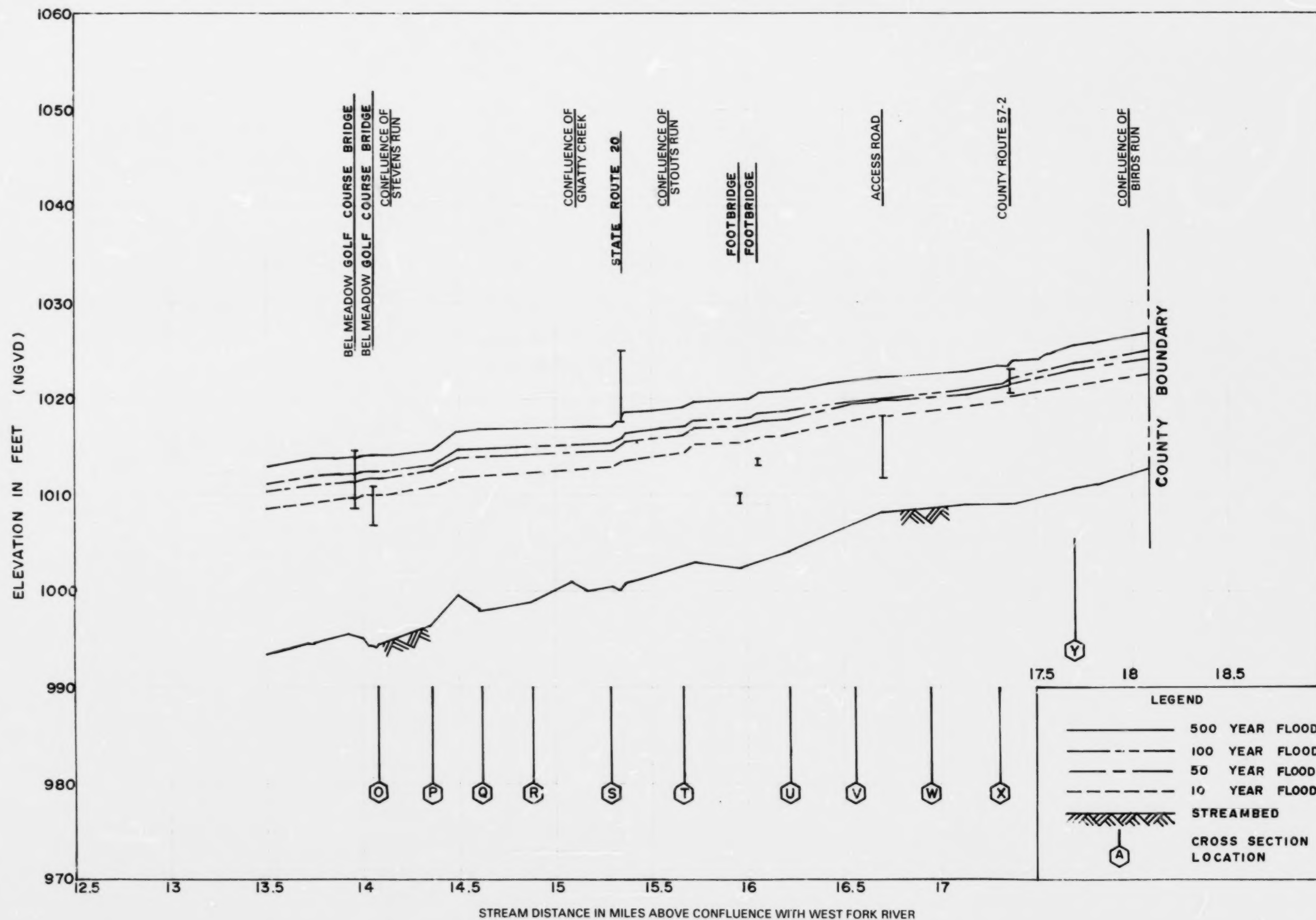
FEDERAL EMERGENCY MANAGEMENT AGENCY
HARRISON COUNTY, W. VA
(UNINCORPORATED AREAS)

ELK CREEK

27P



FLOOD PROFILES	
ELK CREEK	
FEDERAL EMERGENCY MANAGEMENT AGENCY HARRISON COUNTY, W. VA (UNINCORPORATED AREAS)	
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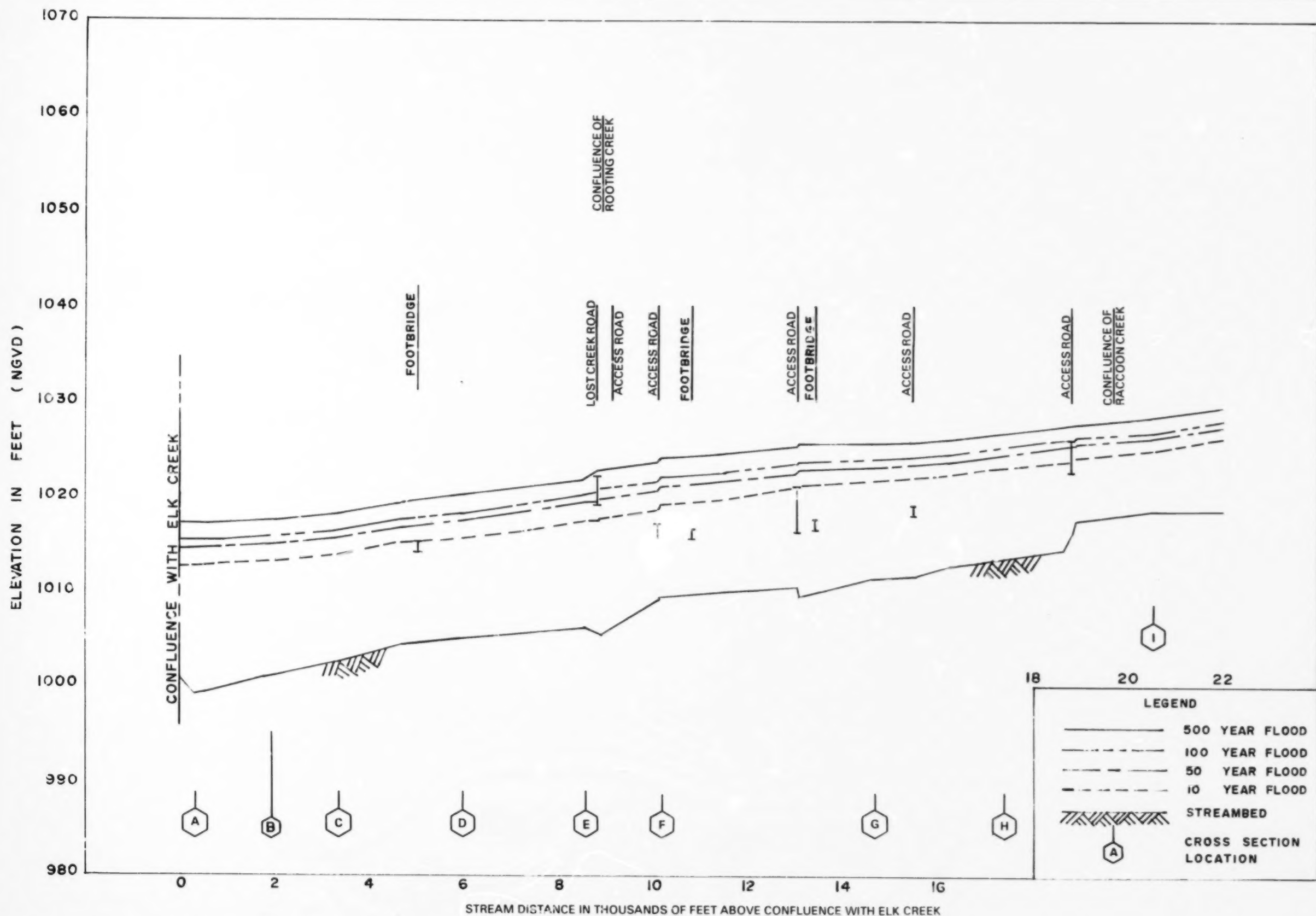


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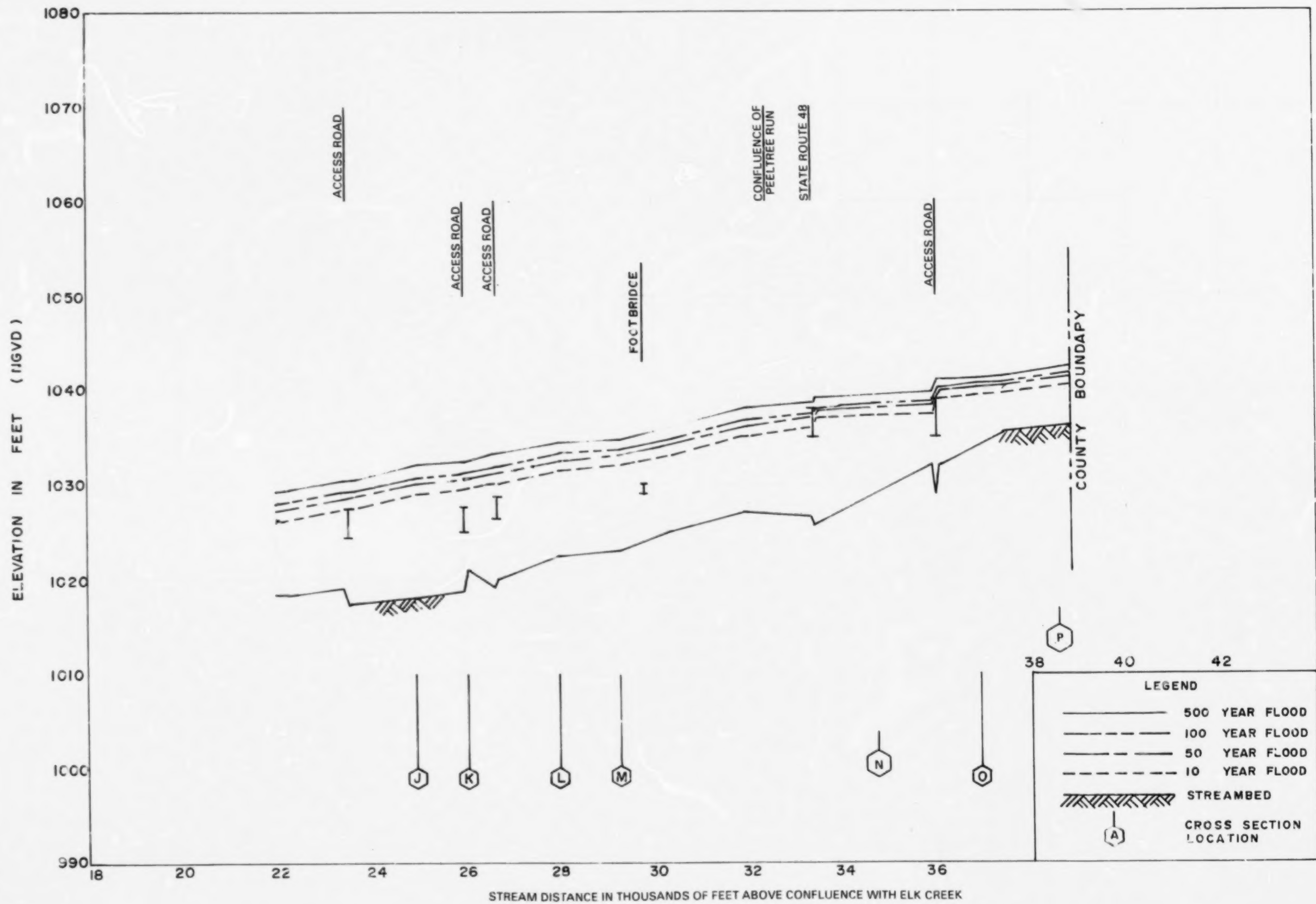
FEDERAL EMERGENCY MANAGEMENT AGENCY
HARRISON COUNTY, W. VA
(UNINCORPORATED AREAS)

ELK CREEK

29P



FEDERAL EMERGENCY MANAGEMENT AGENCY HARRISON COUNTY, W. VA (UNINCORPORATED AREAS)	FLOOD PROFILES
	GNATTY CREEK
	30P



FLOOD PROFILES

GNATTY CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

HARRISON COUNTY, W. VA

(UNINCORPORATED AREAS)

31P